

# A Short Guide to Developing Effective Learning Outcomes and Assessments

## *Introduction*

The purpose of this document is to:

1. Explain the critical importance of an outcome-based approach to course design and delivery.
2. Show the relationships between programmatic outcomes, courses outcomes and assessments.
3. Provide a practical step-by-step guide to help you develop meaningful and effective outcomes, assessments and learning activities for your courses.

## *The importance of clearly defined outcomes and assessments*

As an instructor you will be expected to design and deliver clearly defined learning outcomes and learning assessments for your courses. This expectation is in line with the obligations of your department and institution, and is driven by a number of important considerations:

- **Accountability:** Institutional funding and SACS accreditation require formally defined measurement and assessment of learning.
- **Standards:** The global education environment requires that course credits must be easily transferable between institutions. Employers need to easily evaluate the content of educational programs and courses.
- **Student expectations:** Students increasingly expect a well-defined and well-structured learning environment and clear metrics that will help them successfully meet the goals of the course. As "education consumers", students have a right to see evidence of the value of the product that they are purchasing.
- **Emerging Best Practices:** an outcome-based approach ensures that courses are well-designed to meet programmatic goals. This approach also reinforces effective teaching models and student-centered learning. As an instructor your role become more clearly established as a course designer and learning facilitator, a "guide on the side" rather than the "sage on the stage".

In essence, an outcome-based approach to course descriptions changes the paradigm from an explanation of what a course will **cover** to a clearly-worded summary of what the student will actually **learn**, in other words from mere **description** to measurable **performance**.

As an introductory example a descriptive phrase such as:

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The first module will introduce general control structures using the Java programming language.

can be written to reflect specific learning outcomes as follows:

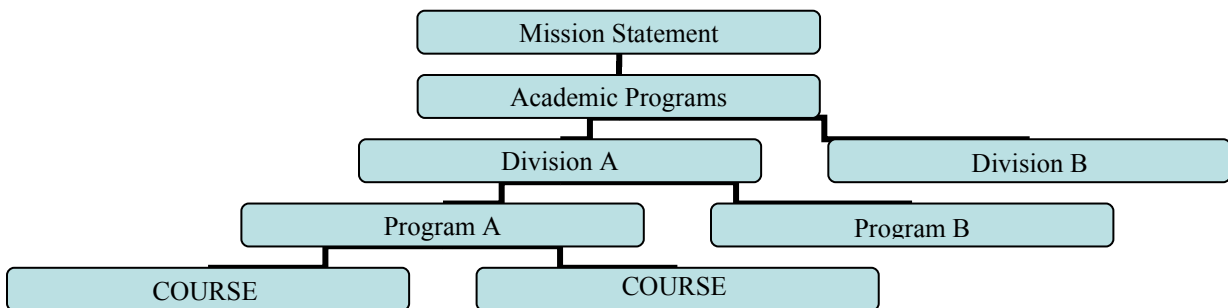
Upon successful completion of the first module, the student will be able to:

- Write an algorithm using pseudocode that can be successfully converted into source code.
- Code and compile a Java source file that includes simple sequential, loop and selection structures.
- Trace source code containing simple sequential, loop and selection structures and correctly predict the results
- Define and apply variables to store program data.
- Identify and correct syntax errors
- Apply standard naming conventions and layout to a Java source file.

### ***Curriculum coherence: relating course outcomes to programmatic outcomes***

Course outcomes, courses and degree programs are all components of a hierarchical structure that originates with the college Mission Statement. The mission provides the context for defining and measuring the primary outcomes of the institution. The organizational structure (divisions, departments and programs) supports these institutional outcomes.

Here is a sample hierarchy:



In this example, at the **Academic Programs** level, general competencies may be identified as outcomes to be delivered by all programs. At the **Division** level, outcomes may be specified in terms of delivering specific programs of study such as Automotive Technology or Computer Programming. At the **Program** level, outcomes will be defined in terms of general competencies within the field. And at the **Course** level, outcomes will be defined in terms of the learning goals of the course itself.

Every degree program contains a set of programmatic outcomes and courses are added, modified or removed from the program as needed to ensure that these

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program outcomes are achieved. Since each course is a critical component of the overall program, it is important that all course outcomes align with those of the curriculums for which the course is required.

As an instructor you will mostly be concerned with outcomes at the **program** level and the **course** level. Here is an example of a simplified set of programmatic outcomes for a Computer Programming degree:

Upon successful completion of the program, the student will have:

- **Outcome #1:** Demonstrated proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic, and the theory of algorithms.
- **Outcome#2:** Exhibited proficiency in the application of modern software engineering techniques to real world business requirements.
- **Outcome #3:** Demonstrated mastery of at least one modern programming language and proficiency in at least one other.

The courses that are to be included in this degree program must serve one or more of these programmatic outcomes. Here is an example of a table used to associate programmatic outcomes with individual course offerings. No single course need incorporate all of the programmatic outcomes but all programmatic outcomes **must** be met by the courses taken collectively. At the same time any course that does not meet **any** programmatic outcomes should not be a part of the degree. Required and elective courses within the program can also be determined by reference to this type of chart.

<b>Course</b>	<b>Programmatic Outcome #1</b>	<b>Programmatic Outcome #2</b>	<b>Programmatic Outcome #3</b>
CIS 100	X		
CIS 120	X		X
CIS 140	X	X	X
CIS 160			
CIS 200		X	
CIS 220			X

Note that this table demonstrates the value of each course in relation to the program as a whole. You may notice that in this example CIS 160 does not meet any programmatic outcomes. This suggests either (a) that the course should not be offered since it plays no role in the programmatic goals, or (b) that the programmatic goals have not been defined sufficiently to embrace all required outcomes. If any of column contained no X's this would indicate that one or more courses needed to be added so that all program outcomes are met.

If you know what programmatic outcomes your course is expected to meet, this will help you to design your course appropriately.

## ***Defining measurable outcomes for your course***

As an instructor you may be required to design your course. If so you will want to start by defining your course's **learning outcomes**. Your course outcomes should be a comprehensive list that defines precisely what a student is expected to learn in this course. The course content should be designed to help the student to meet these learning outcomes, and the student's success in the course must be measured against these outcomes using appropriate assessment tools. Your course content should not contain material or activities that are not directly related to the course outcomes, and your assessment must not contain any topics or activities that do not measure a student's ability to meet your course outcomes.

Each learning outcome must not only specify a learning requirement for each student but must also clearly define the level of understanding that the student is expected to demonstrate. This measurement is indicated using a **behavioral verb or phrase** which describes an observable behavior or behavioral result. These verbs should be easily understood, measurable, and should correctly the expected level of understanding (as defined by Bloom's Taxonomy). Here are some examples of clear and measurable behavioral verbs associated with differing cognitive levels:

- **Know**: identify, recognize, distinguish, define, name, list, label, order
- **Comprehend**: interpret, illustrate, explain, classify, formulate, translate, convert, illustrate.
- **Apply**: use, solve, prepare, demonstrate, compute, perform
- **Analyze**: estimate, compare, catalog, differentiate, interpret, contrast
- **Synthesize**: write, plan, integrate, formulate, design, derive, summarize, build
- **Evaluate**: verify, judge, rank, appraise, justify, support, defend

You will find this list useful as you develop your own outcomes, and determine the level of understanding that will be expected for each learning activity within your course. For example, an introductory course in computer programming might include a learning outcome that requires a student to **identify** a language interpreter and a language compiler, whereas a more advanced course might include an outcome that requires a student to **demonstrate the difference** between a language interpreter and a language compiler,

Here are examples of learning outcomes to be associated with the New Instructor Orientation. Note how the behavioral verbs clearly indicate the level of understanding that is expected in each case.

- Distinguish between learning outcomes at the program and course level
- Demonstrate ability to submit grades using the Colleague software system
- Correctly interpret Identify behavioral verbs in terms of their cognitive level
- Contrast student advising for technical/vocational students and students taking general education degrees as part of the 2+2 articulation agreements with the UNC universities.
- Design a comprehensive list of learning outcomes for a course

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- Explain the significance of SACS to our institution
- Judge the appropriateness of certain actions in light of the Americans with Disabilities Act.
- Contrast an appropriate and inappropriate approach to a student discipline problem.

**Avoiding "bad" verbs:** Be careful to avoid using behavioral verbs that do not adequately define the expected level of understanding or do not readily suggest an appropriate evaluation procedure. The following verbs are to be avoided since they are too vague and the expected level of understanding is not readily apparent:

Know, appreciate, gain knowledge of, comprehend, learn, be aware of, understand.

**Adding conditions:** In addition to using behavioral verbs, you may also want to add conditions that go further to define the methods by which your outcomes will be measured. For example you may need to stipulate time limitations, materials to be used, methodologies to be applied, etc.

**More extensive examples:** Here are some other examples of learning outcomes taken from various courses and disciplines. Most of the examples include notes that address special characteristics that you are likely to encounter as you develop your own outcomes:

**Biology example:** Upon successful completion of the course, the student will have applied concepts of chemistry to physiological systems.

**Computer Information Systems example:** Upon successful completion of the course, the student will have created and managed a network environment with network operating system commands and a variety of troubleshooting tools. (Windows, Linux).

NOTE: when behavioral verbs are conjoined, be sure that the two outcomes are linked together and are not to be assessed and evaluated separately.

**Criminal Justice example:** Upon successful completion of the course, the student will have:

1. Described the principles of community-based policing.
2. Applied principles of community-based policing to specified situations.

NOTE: in this example the learning outcomes will be assessed and evaluated separately (two outcomes) since they are not conjoined.

**Dental Hygiene example:** Upon successful completion of the course, the student will have demonstrated the technique of soft-tissue curettage on appropriate clinic patients.

NOTE: can you distinguish all three elements (behavioral verb, content, conditions) in the example?

**History example:** Upon successful completion of the course, the student will have evaluated historical myths and prejudices that permeate contemporary US Culture.

NOTE: Always check your use of conjoining words such as "and" to ensure that you are not inappropriately combining two outcomes as one. In this example the word "and" is acceptable since it is not describing two different activities.

**Speech example:** Upon successful completion of the course, the student will have organized, outlined, and delivered well-researched speeches to inform and persuade that are tailored to a specific audience.

NOTE: In this example, three behavioral verbs linked. Instructor will have a rubric for assessing and evaluating each activity. The different components could also be weighted differently in arriving at a composite score.

### ***Associating learning outcomes with assessments***

Once you have defined outcomes for your course or course module, you are ready to decide what **assessments** you will use to measure each outcome. A range of assessment vehicles may be used to measure a single outcome. Examples of assessment vehicles are:

Exercise, Quiz, Exam, Demonstration, Project, Paper, Report, Presentation, Team Participation, Homework.

A single learning outcome may be assessed using a combination of assessment tools (for example an exam, homework and a project). And multiple outcomes may be measured using a single assessment tool such as an exam. But it is critical that all outcomes are assessed, and that there is an appropriate relationship between the overall significance of each learning outcomes and the degree to which the outcome is reflected in the overall course assessments. For example if you have defined thirty learning outcomes for your course, then it would not make sense if 80% of your assessments focused on only one of these outcomes, even if all the outcomes are assessed.

Note that while your learning outcomes can be expected to remain relatively consistent, your assessments may vary more significantly from semester to semester. You may even decide to provide your students with alternative assessments so that they can choose an assessment that best suits them as individuals.

**Aligning Your Course Outcomes And Assessments with the Common Course Library Description:** A practical way to assure that your outcomes and assessments are consistent with the Common Course Library description of your course is to construct a table such as the one below selected from REL 110 (Religions of the World).

<b>Course: REL 110 (Religions of the World)</b>		
<p><b>Common Course Library Description:</b> This course introduces the world's major religious traditions. Topics include Primal religions, Hinduism, Buddhism, Islam, Judaism, and Christianity. Upon completion, students should be able to identify the origins, history, belief, and practices of the religions studied. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in humanities/fine arts.</p>		
<p><b>Student Learning Outcomes:</b> After completing this course, you will have:</p> <ol style="list-style-type: none"> <li>1. Analyzed common elements of the world's major religions</li> <li>2. Discussed the origins, history, beliefs, and practices of major religions.</li> <li>3. Examined current issues from an interfaith perspective.</li> </ol>		
<b>Module</b>	<b>Module Objectives</b>	<b>Module Assessments</b> (Assessment numbers match objective numbers.)
1	<p>After completing this module, you will have:</p> <ol style="list-style-type: none"> <li>1. Discussed common elements in religions including beliefs, worship, symbol, and myth.</li> <li>2. Traced science's relationship to religion through the centuries.</li> <li>3. Examined several approaches to studying religions including the pluralistic approach.</li> <li>4. Defined terms relating to religious studies.</li> </ol>	<p>Your work will be assessed with:</p> <ol style="list-style-type: none"> <li>1. Quiz</li> <li>2. Quiz</li> <li>3. Db, Personal Beliefs Paper</li> <li>4. Quiz</li> <li>5. Module 1-4 Exam</li> </ol>
2	<p>After completing this module, you will have:</p> <ol style="list-style-type: none"> <li>1. Discussed the characteristics of indigenous religions.</li> <li>2. Recognized important terms associated with indigenous religions.</li> <li>3. Described specific practices and beliefs of several Native American cultures.</li> <li>4. Described specific practices and beliefs of several Traditional African cultures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Db, Quiz</li> <li>2. Db</li> <li>3. Quiz</li> <li>4. Db, Quiz</li> <li>5. Module 1-4 Exam</li> </ol>
3	<p>After completing this module, you will have:</p> <ol style="list-style-type: none"> <li>1. Described the origins, defining characteristics, major beliefs, and contemporary practices of Hinduism, Jainism, Buddhism, and Sikhism.</li> <li>2. Examined differences and similarities in Hinduism, Jainism, Buddhism, and Sikhism.</li> <li>3. Discussed the relationships of these religions today.</li> </ol>	<p>Your work will be assessed with:</p> <ol style="list-style-type: none"> <li>1. Quiz, Db, Moral Dilemmas Paper</li> <li>2. Quiz</li> <li>3. Db</li> <li>4. Module 1-4 Exam</li> </ol>
4	After completing this module, you will	Your work will be assessed

	have: <ol style="list-style-type: none"><li>1. Traced the origins of Judaism, Christianity, and Islam.</li><li>2. Discussed significant events relating to the religions' founders.</li><li>3. Examined the importance of scripture.</li><li>4. Explained some of the core teachings.</li><li>5. Described contemporary expressions of the religions.</li><li>6. Discussed current issues relating to the religions.</li></ol>	with: <ol style="list-style-type: none"><li>1. Quiz, comparison paper</li><li>2. Quiz. Db</li><li>3. Other Religions Project-Interview/Religious Services</li><li>4. DB</li><li>5. Module 1-4 Exam</li></ol>
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### ***Developing your course assessments***

As you develop your course assessments (for example quiz questions, or a homework or project), be careful to check the behavioral verbs that you applied to your learning outcomes. It is important that each assessment not only reflects your learning outcomes, but that the assessment is targeted at the level of understanding defined in your outcome.

Your learning outcomes can also help you to evaluate the appropriateness of textbooks and other learning materials for your course. Be careful to check that textbook exercises and test banks will meet your learning outcomes at the appropriate understanding level, and that any "prepackaged assessments" do not reflect learning outcomes that are not part of your course requirements.

### ***Developing your course learning activities and course schedule***

Now that you have defined your course outcomes and assessments, you are ready to develop your course learning activities. Not that by taking an outcome-based approach, you are now in an excellent position to consider exactly what type of learning activities will help your students to meet your course goals and associated assessments. Your course schedule should emerge quite naturally from this, and should reflect the appropriate time needed for your students to perform your defined learning activities and complete the course assessments in order to meet your course learning outcomes.