What is a Curriculum Map?

When one hears the word "map," the images that come to mind could vary from an intricately-folded large paper with lines of various colors representing the roads to travel, to an app on a cell phone that speaks in a controlled voice telling the listener to "turn left in 200 yards" in order to get to the destination. A map could be simply a set of directions on a system of roadways, or a map could identify stores and shops, restaurants and fast food establishments, doctor's offices and hotels. Different formats of a map could be used for different purposes, and once the user understands his or her needs, the map can provide directions, give an overview, or even lead the user to a link to a webpage. The concept of a map indicates the user is searching for some information and has gone to the map to provide the information needed, with targeted layers of information available in maps with different foci.

Likewise, a curriculum map will look very different from one user to another, from one school to another, from one university to another. There are multiple designs for a curriculum map, and depending on the information presented, a curriculum map can be very simple or quite complex. If the purpose is to show one set of student learning objectives, a simple two-level graph-type curriculum map can suffice, showing where each objective is taught, or in a little more detailed format, showing where the objective is introduced, expanded, and mastered.

Many programs use a two-level curriculum map to show that required objectives are being taught. A simplified example of this could be for a college level general studies mathematics curriculum:

Student Learning Objectives	College Algebra	Trig	Calculus 1	Calculus 2	Discrete Structures	Differential Equations	Linear Algebra
Reasoning/ Problem Solving	X		X	X		X	
Set Theory	X						
Functions	X	X	X				X
Identities		X	X				X
Matrices	X				X		X
Sequences	X				X		
Integrals			X	X			
Parametric Curves		X		X			
Differential Equations						X	
Eigenvectors							X
Boolean Algebra	X				X		

Disclaimer: This is far from an accurate summary of a mathematics degree; it is simply an example of a 2-level map

These two-level curriculum maps serve a very specific purpose. They show the reader in which courses certain student learning objectives are presented, or at what level the objectives are presented. They are simple to understand and give a very concise view of the information. Two-level maps generally give information on one variable, such as timing of content presentation, overlaps of content, forms or timing of assessment, or other variables for review.

Sometimes more detail may be needed. The two-level curriculum map is a tool used to report student learning outcome coverage information to an outside entity, such as a committee, a board, or an accrediting body. It is a straightforward and minimal way to present a two-dimensional structure of the learning that will be obtained through the course of a program. But internally, while these two-level maps do give a snapshot of one particular variable, a more detailed curriculum map can have many more uses.

How Can a Curriculum Map Be Used?

Ideally, the best road map is a combination of a street map, a topological map, a google search, and a globe. Depending on the information needed, a map can show how to navigate to or from a location, alternative routes if there is a transportation issue, whether the roads are interstate, state highways, or two-lane roads, the size of the town or city being traversed, what amenities are available at any location, and even where there are construction delays. One can plan an entire trip with the combined use of maps on paper and through digital sources.

A layered curriculum map, then, also has many uses. Depending on the information included in the map, faculty can use the map to see how the course was designed last semester or how the previous professor laid out the content. Faculty can also use the map to explore other courses and plan horizontally with their peers to have cooperative lessons that cross course numbers. Faculty can also look vertically at courses prior to their own and discover whether certain content has already been presented to students in other courses or formats, or at courses that come after their own to see if content is re-introduced and followed up on by other faculty. Faculty and administration can review the curriculum map for content redundancies as well as for missing content. Should students show a lack of mastery of an outcome or objective as they move toward graduation, faculty can use the curriculum map to discover where that objective was first introduced, where it was followed up on, and how often it was formally assessed. The map can then be used to redesign the curriculum to cover the required objective more effectively. The accrediting body might use the curriculum map to assure all required objectives are being taught, at what level they are being taught, how they are assessed, and if the content meets the academic requirements put forth in their accreditation guidelines.

A curriculum map is a place to go to get answers to questions about the curriculum. Whether the map encompasses one-degree program, one general education department, or the entire curriculum offered across a campus, a map is a one-stop shopping place for information. A completed curriculum map can be used to answer questions such as:

- Where is this taught? What semester and what class?
- Why are we teaching this? Does it have anything to do with any of our student learning outcomes? Can we eliminate it from the curriculum or make it an elective?
- Where are we teaching this? Our graduates get jobs and then can't seem to do this activity. Do we need to include this in our curriculum or increase where we present the content?
- How is this assessed? Is there a written exam or a project or an activity to complete?
- Is this content approached from several different perspectives in several different courses?
- Are these two courses similar enough to combine into one course?
- Does this course have so much content, we need to break it into two courses?
- Could the content of this five-credit course be taught in a three-credit format?
- Dr. Smith won the lottery, resigned, and moved to Jamaica. Could you step in where he left off and take over his classes for the rest of this semester?
- Scientists have just discovered another process to do this marvelous thing and we need to include it in our content. Where would it best fit into our curriculum?
- These students can't seem to do this equation type. Weren't they taught that before or is this really the first time they're seeing it? Should it be taught before my course?
- How can every student have an A in this course? Is the assessment truly measuring mastery of the objectives?

This list could go on with many more curriculum-related questions. The curriculum map should be the go-to place for answers about the educational program being mapped.

Time & Personnel Needs

Before getting into the actual design of the map, it needs to be stressed that creating a curriculum map, especially from scratch, is not an overnight task. Depending on the size of the educational program(s) being mapped, the stability and history of the curriculum, and the participation from the faculty, it could take several months or even a couple of years to finally have a meaningful and usable map. If several staff members are involved in data entry, the task moves quicker. It is also imperative to have qualified and knowledgeable faculty involved in the linking of the levels of the map. Staff can type objectives and assessment items but are not qualified to make the call on linking the content from a question to a lecture.

Once it has been decided that a curriculum map is needed, desired, and often required, it is necessary to get the buy-in of all stakeholders. Most importantly, the program director, the dean of the college, the president of the university, or the chairman of the board must be passionate about the project. If it is not supported from the top, the efforts to complete the curriculum map will be greatly challenged. When the administration demonstrates the many varied and useful benefits of having a curriculum map and keeping it updated, faculty learn their own uses for the information in the map and how important it is for them to both follow the direction in which the map points and to keep the map accurate from term to term.

Participation in creating the map making must be strongly encouraged, and with some effort, could be a positive and creative process. While very few educators consider mapping to be "fun," they do appreciate what the end result gives them. It is important to have at least a few "cheerleaders" among the faculty who will not only complete their piece of the map but use it actively and share with others how having the map has helped them. When people see their peers finding value in a product or service, they ask about it, they watch the peer use it, and they start to see themselves getting the same benefits.

There needs to be a team who will input the actual data into the map. These detail-oriented workers will type in the objectives at each level of the map, and according to the information provided by the faculty, will identify the links. They are also responsible for inputting keywords, the key to making a map user-friendly. These data-inputting staff are the worker bees of the creation of the map and should be adequately acknowledged and appreciated.

As may be expected, the curriculum goes through small—and sometimes large—modifications each semester. A new faculty member comes on board. Courses are moved from one semester to another. New information in the content area must be included somewhere in the content. The data entry for the curriculum map does not end. The map is a living document that changes with the curriculum of the program, and it is the responsibility of all involved in the change to see that the information gets to the curriculum map.

Finally, there needs to be a single person (or at most two) who are ultimately responsible for regularly updating the map and ensuring it is easily accessible to all concerned parties. This person or persons will make sure the map is updated at regular intervals, be available to faculty and administration to use the map for their answers and be able to speak to the map at all levels and links. This map master will be the heart of the curriculum map, the one person with the big picture that can find the answer to all of those questions asked of the map. Whether answering internal content or assessment questions, working with committees to identify gaps or redundancies in the curriculum, or helping with co-curricular experiences with another school, the map master will be a great asset in the continual improvement of any educational system.

Levels of the Map

How many levels a curriculum map will have depends on how deep into the curriculum the institution wants to map. That, in turn, depends on the desired function of the map. Do you need a map of a city? Or a state? Or a country? Or the world? Will the map only show one department's curriculum? Or is the map of a degree program? Are you mapping an entire undergraduate curriculum offering at a university? Or is this a map of a certificate program? Or a map of the timing of content presentation?

For the sake of example, we will look at a curriculum map of a professional program—the curriculum required to obtain a DVM degree—Doctor of Veterinary Medicine. This map was created at the College of Veterinary Medicine (CVM) at Lincoln Memorial University (LMU) in Tennessee to show the entire picture of the curriculum content from exam questions all the

way to the mission statement of the university. The purpose of the map is to document everything that is taught during the program.

This map has six levels, each with its own set of objectives, goals, competencies, or educational expectations. At each level, the individual objectives are listed and are linked up to the higher level and down to the lower level. Thus, by selecting any objective at any level, one can identify why it is being taught and the ultimate goal of the content.

Level 1 holds the LMU strategic goals. There are ten goals, six of which are directly relevant to the curriculum of the colleges.

LMU – CVM Curriculum Map

| LEVEL 1 | LMU MISSION STATEMENT | LMU STRATEGIC GOALS |
| LEVEL 2 | CVM MISSION STATEMENT | CVM GOALS & OBJECTIVES |

LEVEL 3
DVM LEARNING OUTCOMES
Clinical – AVMA Competencies
Professional – NAVMEC Competencies
Academic - COE Competencies

LEVEL 4
Courses
Course Objectives

LEVEL 5
Lecture Objectives KEYWORDS
Lab Objectives KEYWORDS

LEVEL 6
Assessments - Exams, OSCEs, Clin Evals
KEYWORDS

Level 2 has the mission statement and goals of the College of Veterinary Medicine. There are six goals, four of which can be met by the curriculum of the college. Each of these leads directly back to one of the Level 1 goals of the university.

Level 3 is the list of professional veterinary competencies as outlined by both the American Veterinary Medical Association (AVMA) and the Association of American Veterinary Medical Colleges (AAVMC). These sixteen competencies are shared by nearly all colleges of veterinary medicine, and in this map can be linked to the college goals in Level 2.

Level 4 contains the courses included in our curriculum. Each course has a set of course learning objectives, and those objectives tie directly to one or more of the Level 3 professional competencies.

Level 5 is a listing of each and every lecture, lab, and curricular activity that takes place in every course during the four-year program toward the DVM. This is an extensive level, and each lecture or lab objective is tied directly back to one of the course objectives. This level is the heart of the curriculum and holds the details in exactly what is being taught where and when and by whom. This is the level where the keywords live, although they occasionally can be found in other levels as well.

Level 6 has its own document. Level 6 holds the assessment information for every lecture and lab presented—it shows exactly how student learning is assessed and how mastery of the
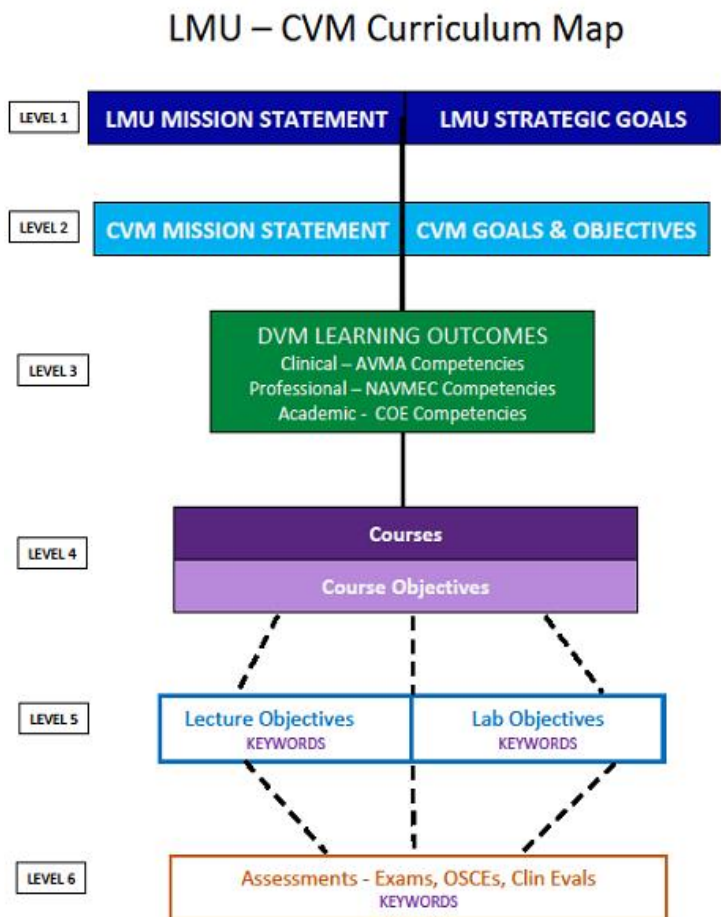
competencies is measured. Level 6 is also a very high security document, as it has the actual exam questions, quiz items, project rubrics, and grading mechanisms for every quiz, test, project, and graded assignment used for student assessment. Each item is linked back to the lecture or lab objective that it is assessing and can be identified with keywords usually found in the stem of the question or project.

The professional program outlined in the example above chose to begin the curriculum map with the mission statement of the university. Many curriculum maps would not include the top two levels. Some only map to the professional competencies. Others may not include the individual exam questions in the map. Selecting what the map is going to be designed to show and how many levels the map will need is the first step in creating the complete curriculum map. Within a department, there may only be three or four levels. For an entire university map or undergraduate program map, there may be eight or ten branches at a level, one for each department or one for each degree offered. The beauty of a curriculum map is that it can be customized to match, in design, the program or degree that is being mapped, and it can show as much or as little detail of the curriculum needed to fit the desired function. A map of a full university program might look similar to this and go as far as mapping to the course objectives for mapping purposes.
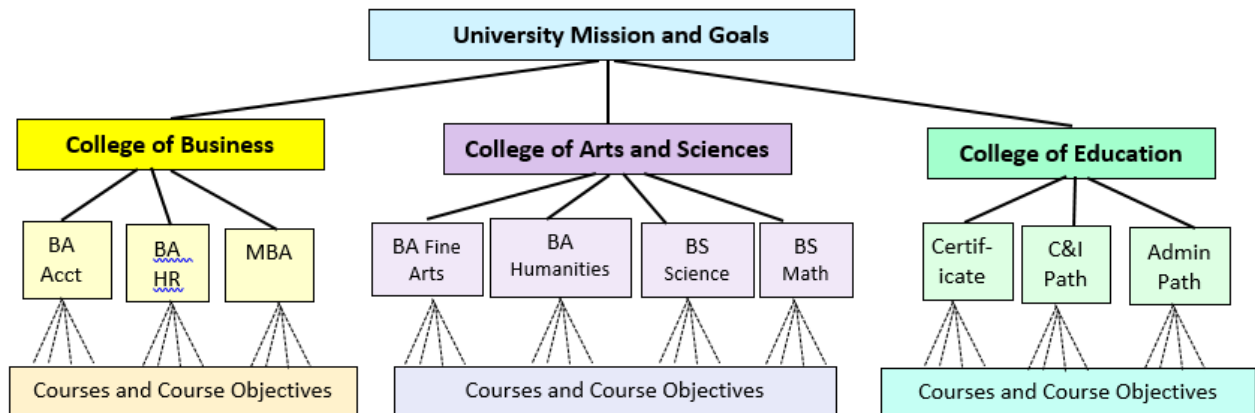
In the elementary and secondary educational system, a curriculum map could show the student learning objectives from kindergarten through 12th grade by content area, following what students learn from kindergarten through high school. A curriculum map for an elementary K-5 school could follow content areas vertically through the grade levels like this:
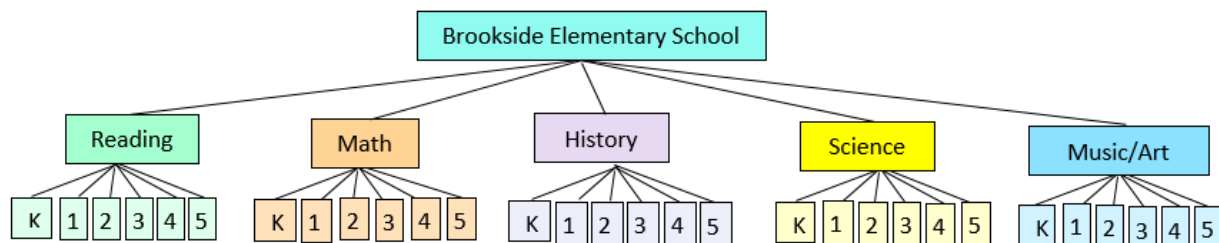
The report above could show administration where each objective in a content is introduced, reinforced, and mastered throughout the elementary experience. Another possibility for mapping elementary curriculum could show horizontally what part of the content is taught at what level, especially helpful for classroom teachers and the principal of the school:
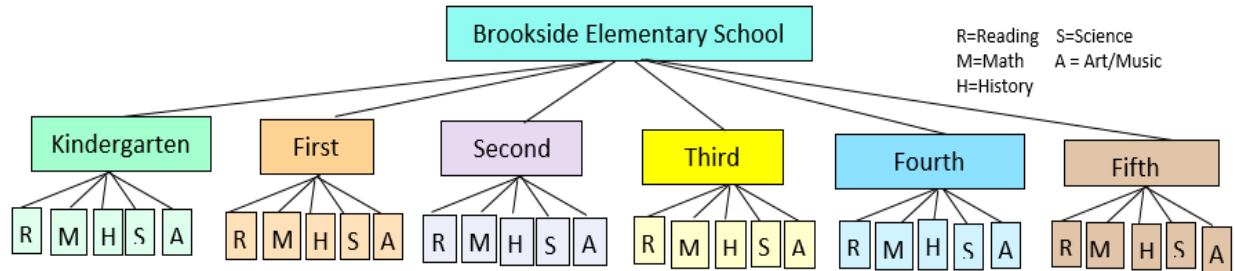
Notice that both of these examples are mapping exactly the same student learning objectives, but in different designs depending on the requirements and desires of those requesting the map.

Format – Excel

There are many software programs in existence that have the capability to create a curriculum map. Several common learning management systems have a curriculum mapping feature. Some export information directly into the map, while with others, the user inputs information. Many come with a pre-set mapping format and the map matches what the programmers thought it should look like. Others can be customized but may or may not show relationships from level to level. Still others do not have the capability to hold the detailed information required in the map. Some institutions find curriculum mapping software to fit their needs, and that certainly makes the initial creation of the map much easier than doing it from scratch. For the previous example of a professional degree map, LMU-CVM did not find a program whose mapping software fit what they were trying to do; therefore, Excel was chosen as the software of choice for the LMU-CVM curriculum map.

Excel was chosen largely due to the capability for searching the entire document for a word or term. It is this searchability that makes a curriculum map most useful in the day-to-day educational business of a school. Any software program chosen for the curriculum mapping of an educational program needs to have the capability to be searched thoroughly to identify information.

Searchability – Keywords and Codes

The keywords are the heart of the map. If you relate a curriculum map to a road map, the keywords are the roads that one uses to get from place to place, from city to city or from house to restaurant. In a curriculum map, the keywords are the "roads" that connect one course to

another, a lecture objective to an exam question, or a course objective to a professional competency.

Once the keywords are in place, the map is ready for use by faculty, administrators, and anyone who has questions about the curriculum. Where do we teach about poison ivy? Search the lecture level for poison ivy. Why do we teach students to estimate the size of a marble? Search estimate size and follow the links up to the competency that requires estimating the size of a tumor in an organ. Does the first semester expose students to research citations? Search for citations and see which courses use that concept. Do accreditors want to know how competency two is assessed? Go to competency two and follow the links down to level 6. Everything that links up to competency two is the assessment of that competency.

If there are a set of specific goals, competencies, or student learning objectives that are the heart of the program, such as standardized testing competencies, specific nursing competencies, or competencies required for a degree, these can be abbreviated with an alphanumeric code to make searching and data input much easier. In the LMU-CVM map, the code for an objective may look like this: 3.25 (level three—professional competencies, competency #25) or like this 5.710.44.3 (level 5—lecture objectives, course 710 – Anatomy, lecture #44, objective #3) so the map master can search by code rather than typing in an entire sentence or paragraph. By looking for 3.25, the entire map can be searched to see which objectives link to competency 25. These codes for the objectives would be created by the map maker and have a logical set of parameters clearly outlined so those seeking information can not only find what they seek but understand what they find.

Summary of Curriculum Mapping

A curriculum map is a very useful tool for understanding what is being taught, where, and how. It is a picture of the intended design of the curriculum and can be used to answer questions about the curriculum. Inclusion of keywords makes a curriculum map searchable and allows flexibility in identification of objectives at all levels of the map. When a curriculum is under review, the map allows for a complete and transparent view of the current design of the curriculum. It also shows objectives that are not reinforced as well as those that are covered so much they could be lessened to allow room for other content. The map can show places where there is room to add content and places where the content is so packed, more hours need to be required. Any question about the curriculum of a program, a school, or a subset of either can be answered through a complete and accurate curriculum map.