Assessing Student Learning in Natural Resources:

Recent Efforts at the University of Arkansas at Monticello

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Background

- Society of American Foresters (SAF) accreditation standards
- Nationwide trend in accreditation standards
- Other pressures: legislatures?
- Is this just another fad?

School of Forest Resources (SFR)

- SFR administration's take on changes in assessment/curriculum standards

    * Faculty ownership

    * Any change in the assessment structure must also benefit SFR's teaching program

- Administrative structure: Assessment Committee

WHAT STEPS DID WE TAKE AT SFR?

- There was a general agreement that we should do something about it

- The SFR Assessment Committee met on June 21, 2005

- It was decided that starting fall 2005, every course syllabus will include specific, measurable learning objectives

- Students would be expected to achieve these objectives by the end of the semester

SFR STEPS CONTD.

- Every course syllabus will also clearly indicate how the students' ability to achieve the learning objectives would be measured and ultimately how these measurements would be reflected in their grades

- The Committee felt that it was important to leave it up to individual instructors as to how these learning objectives would be measured; i.e. pass-fail, pre and post tests, etc.

ASSESSMENT COMMITTEE CONCERNS

- While efforts to improve student learning assessment are certainly well-meaning, it may contribute to a perception of instructor fault when students fail to achieve the learning objectives

- The committee agreed that such a situation would be unfair since many of our students tend to come into a course unprepared

- Their prior grades may not always be a good indication of their preparedness. That is, how do we deal with a student that received a "B" in Trigonometry but does not know how to calculate the area of a circle?

CONCERNS CONTD.

- There were also concerns regarding credit for time spent on these additional responsibilities
- Teaching load is already a problem and, not surprisingly, has a negative impact on research
- How would these additional responsibilities be reflected in our annual evaluations?

WHAT DID WE ACTUALLY DO IN FALL 2005?

- The faculty met a few days before the semester and began to discuss how to deal with this issue

- The idea of "core competencies" (CC) was discussed and adopted

- CCs are specific, measurable learning objectives

- Students would not be able to successfully complete a course without fulfilling the requirements of these CCs

How did it work?

- The SFR faculty conducted a "trial run" of the new assessment structure
- Students by and large demonstrated their displeasure with the new system
- The faculty had mixed feelings
- Let's look at some of the concerns….

THE DAY AFTER….

- Dealing with incompletes
- Faculty costs:

    * Redesigning courses

    * Implementation

    * Paperwork
- Student reactions

WHAT HAPPENED NEXT?

- We continued to implement the CC requirement for SFR courses

- Many of the initial concerns eventually subsided

- However, we were fully aware that this was only a part of the solution. The question of how we would use this course-level data for program-level assessment still remained

- Then in early 2009, I, as the Assessment Coordinator, pitched the idea of taking the "next step" to our Dean

PROGRAM-LEVEL ASSESSMENT

- After a brainstorming session with the Dean, he and I came up with the details of program-level assessment.

- The idea was to take our capstone course as the starting point.

- Students take this course in the spring semester of their senior year.

- Since the students are expected to apply all the knowledge acquired at SFR, we can logically consider this course as the culmination of their learning process.

PROGRAM-LEVEL ASSESSMENT CONTD.

- We can then take the core competencies of the capstone course and establish backward linkages with other courses throughout the curriculum.
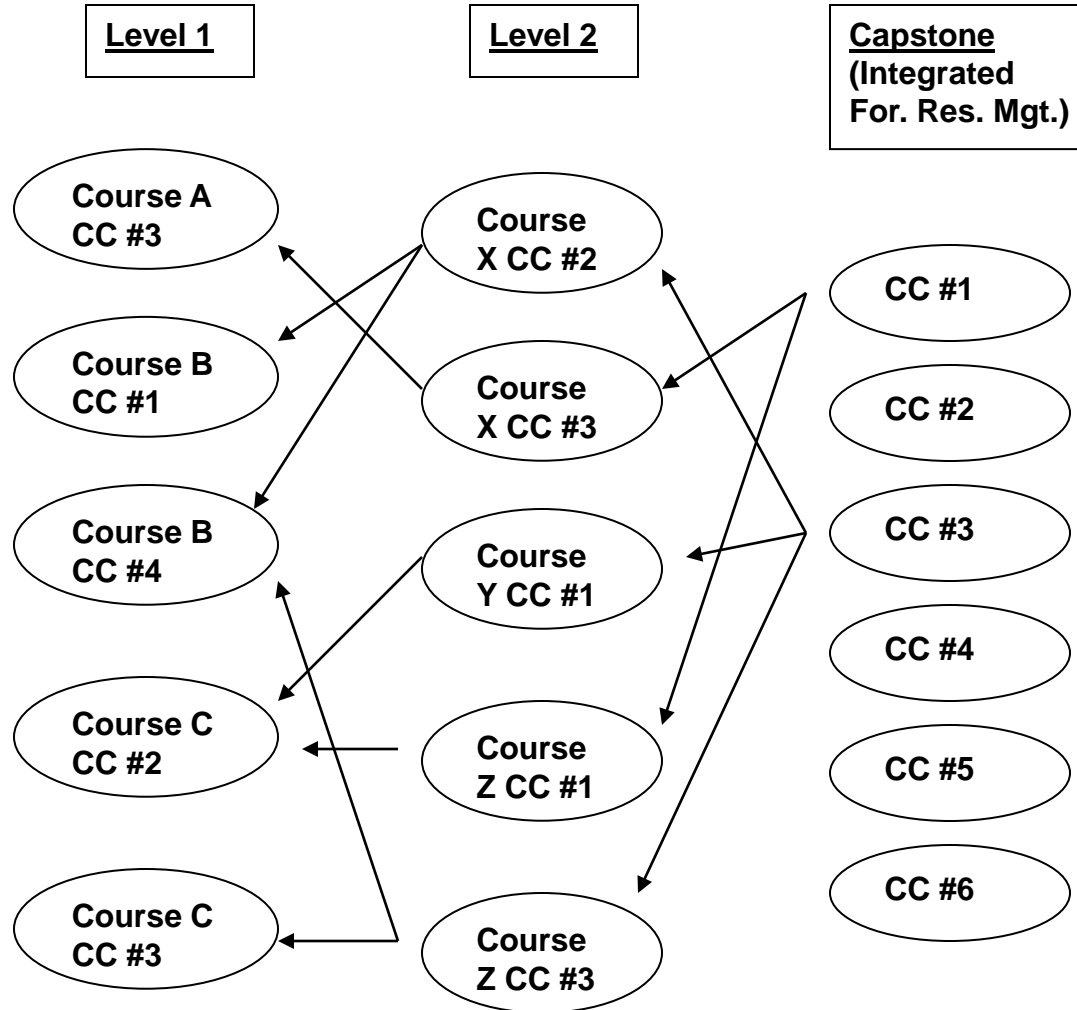
FOR 4823 Integrated Res. Planning and Mgt. CC #5:
Analyze inventory data and project future conditions

Tier 2

FOR 4684 Natural Resource Economics/Management CC #7:
Use growth and yield models to project forest conditions to future states

Tier 1

FOR 2273 Forest Measurements CC #2:
Gain a better understanding of the mathematical and statistical methodologies used in natural resource management

FOR 2273 Forest Measurements CC #4:
Gain an ability to use computers when achieving the other objectives

PROGRAM-LEVEL ASSESSMENT CONTD.

- Once these linkages have been established, we can then link student performance in the capstone course with their performance in other coursework taken throughout the curriculum.

- This allows us to look at student performance as a whole and make changes to the curriculum as needed.

PROGRAM-LEVEL ASSESSMENT CONTD.

- So, how does the system actually implemented?

- At the end of every semester, I ask each individual instructor to submit an assessment report on student achievement of CCs for each of their courses.

- I then aggregate these data with past data for each course and prepare a course assessment report.

FOR 4864: Forest Economics and Management

Instructor: Dr. Matthew Pelkki
Offered every fall semester

Learning Objectives:

(LO1) make decisions based on marginal costs and benefits,
(LO2) construct supply and demand curves for forest products,
(LO3) recognize market structures and understand supply and demand interaction
(LO4) recognize market failures in natural resource economies and effects of government interventions,
(LO5) calculate forest taxes,
(LO6) value timber and non-timber products,
(LO7) use growth and yield models to project forest conditions to future states,
(LO8) determine optimal rotations for trees and forest stands,
(LO9) determine sustainable levels of allowable cut based on volume and area,
(LO10) compare forest planning and administration in public and private settings,
(LO11) formulate simple forest-wide harvest schedules and mathematical models,
(LO12) complete an integrated forest planning exercise for a single forest management unit.

Type of Assessment:

Multiple attempts; students are give up to 4 attempts over the course of the semester to achieve each learning objective.

Student Performance Summary:

Numbers represent mean number of attempts to achieve each learning objective.

		LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
Comb. Mean	2007-08	1.67	2.00	1.50	1.58	1.25	1.50	1.67	1.58	1.67	1.08	1.17	1.00
Cohort	2007	1.88	2.00	1.63	1.75	1.13	1.75	1.25	1.88	1.88	1.00	1.25	1.00
	2008	1.25	2.00	1.25	1.25	1.50	1.00	2.50	1.00	1.25	1.25	1.00	1.00

FOR 4362: Wood Structure and Forest Products

Instructor: Dr. David Patterson
Offered every spring semester

Type of Assessment:

Pre and post tests; Students are given a pretest for every exam over the course of the semester; four exams total.

Student Performance Summary:

Numbers represent mean scores for each of the tests.

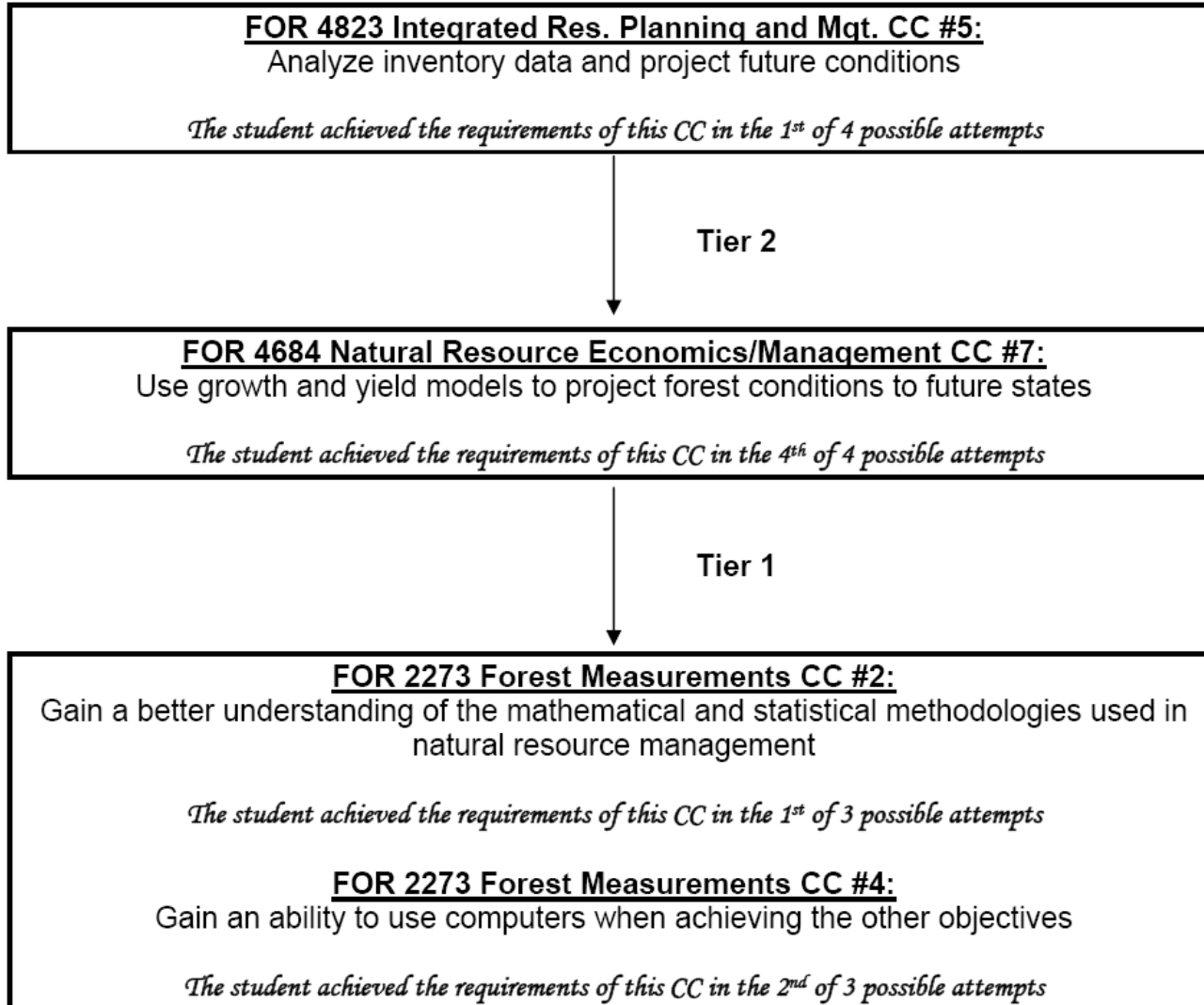|		Exam 1		Exam 2		Exam 3		Exam 4	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Comb. Mean	2006-08	13.78	80.26	11.48	77.74	11.22	74.22	7.04	87.83
Cohort	2006	20.00	86.00	11.57	81.71	12.29	74.43	8.00	90.00
	2007	9.90	78.50	13.10	76.50	13.60	73.50	5.00	86.60
	2008	13.00	76.50	8.67	75.17	6.00	75.17	9.33	87.33

PROGRAM-LEVEL ASSESSMENT CONTD.

- Once I receive the assessment report for our capstone course, I then associate each student's performance in the capstone course to their other coursework through already established linkages.

Student Name: XXXXXXX XXXX
Student ID: XXXXX7952
Semester and Year First Enrolled: Fall 2005
Transfer Student? No
GPA: 2.91

FOR 4823 Integrated Res. Planning and Mgt. CC #5:
Analyze inventory data and project future conditions

The student achieved the requirements of this CC in the 1st of 4 possible attempts

↓ **Tier 2**

FOR 4684 Natural Resource Economics/Management CC #7:
Use growth and yield models to project forest conditions to future states

The student achieved the requirements of this CC in the 4th of 4 possible attempts

↓ **Tier 1**

FOR 2273 Forest Measurements CC #2:
Gain a better understanding of the mathematical and statistical methodologies used in natural resource management

The student achieved the requirements of this CC in the 1st of 3 possible attempts

FOR 2273 Forest Measurements CC #4:
Gain an ability to use computers when achieving the other objectives

The student achieved the requirements of this CC in the 2nd of 3 possible attempts

CONCLUSIONS

- The second phase of the assessment system is still relatively new and is still being fine tuned.
- The students and the faculty have adjusted well to the course assessment phase.
- Students have now accepted the fact that they have to satisfy these requirements in order to successfully complete a course.
- The faculty have also integrated this to their day to day course management very well.
- It is, however, a substantial amount of work for the Assessment Coordinator (moi!) . It is just one of my several hats, so time management is still an issue for me.