



UML-2 Object Modeling Homework

March 5, 2014

This scenario describes the “DRS” assignment with activity dates!

©L. J. Waguespack, Ph.D., 2010

Academic Degree Requirement Summary / Degree Audit Summary Support

Each student enrolled in a degree granting program is required to complete a series of designated milestones before the degree itself is conveyed. Those milestones in most cases are called courses. Bentley University offers degrees in several academic disciplines and sub-disciplines which are prescribed by the college's faculty and documented in the publication of the college's "catalog." A catalog is a listing of all the academic programs, their respective requirements for degree granting and a listing of all the courses offered by the college that may be applied variously to those degrees. College catalogs are usually published annually and the "current" catalog which a student received upon entry to an academic program becomes the applicable system of requirements that the student must satisfy for eventual receipt of the respective academic degree.

Individual academic programs may be modified by the faculty from time to time. Those changes in requirements and available courses usually become "current" upon the annual publication of the college catalog. Most institutions maintain a "no harm" policy upon catalog publication that means that students who began academic programs under previous catalogs are allowed to complete their degree programs under that catalog unless they choose to adopt the current catalog. Under this policy different students who are enrolled in the "same" academic program may actually have different requirements for degree completion based upon the academic catalog that was current when they began their studies.

Each course completed by a student is recorded in a document known as a "transcript." It maintains a continuous record of all academic work attempted and/or completed by the student. The

transcript is the final source of documentation for determining such things as grade point average, academic standing, academic maturity level, and graduation requirement completion. Since a transcript is a general record of any and all academic work, it is not specific to an academic program. Students, for example, may change academic programs over the course of their college tenure and therefore have a variety of courses in the transcript that apply or do not apply to any particular degree program. Not until a student formally "applies" for graduation with a specific degree is the transcript "audited" to determine final completion of degree requirements.

Transcripts may be quite long and "circuitous" in their accounting of academic work. Bentley University uses an ancillary document to help students keep abreast of their progress toward a particular academic degree. The degree requirement summary, DRS, (or degree audit summary, DAS) records degree requirements for a specific academic program along with the academic work found on the transcript that applies to each specific program requirement. The DRS/DAS serves as a checklist indicating both progress to date and the balance of work yet required for degree completion. The DRS/DAS is a useful tool for tracking student progress. It is used by students, advisors, curriculum designers, course schedulers, academic standing / probation committees, department chairs, academic deans, and registrars.

The DRS/DAS is a "living" document. Since programs change from term to term and students may change programs from term to term, a student may change from one DRS/DAS to another several times in an academic career. In addition to recording the progress of the individual student, the DRS/DAS is also used to record individualized exceptions to the degree requirements of a particular degree program granted to that student. These exceptions take the form of acad-

emic credit transfer and course substitution. Transfer credit is usually recorded on the transcript indicating course work completed at other institutions but acceptable for credit at Bentley. Course substitution is usually only recorded on the DRS/DAS. It is designated by an authorized academic advisor and certified by an appropriate academic authority's signature. This is a common result of "promoting" a student from a prior set of program requirements to the current catalog. The number of individual DRS/DAS configurations, the variety of changes that may be made, the number of different college community members who use them and the "contractual" implications of the DRS all combine to make managing DRS's a challenge. The task of this semester's project is to assess the opportunities for automated support of DRS management, to propose such support as would improve the current effectiveness of DRS use on campus, and to demonstrate by developing a prototype application system how such support would be helpful to administration, faculty and students alike.

Object Modeling the DRS

*Phase 1 **Due March 26, 2014**: Given the narrative above you should be able to identify primary issues in the DRS process that would be modeled effectively with classes in a class diagram. The narrative is purposefully limited in detail. You're an experienced Bentley student! Use your "domain knowledge" to consider what functions the DRS will have to support will have to support.*

You may wish to begin your analysis of the DRS problem by drafting some Use Cases for the various activities that students / faculty to use the DRS to assist him/her.

Once you've identified all the core classes that explain the business rules in this problem you will draft a useful class diagram with the appropriate attributes and services that the DRS needs to keep his/her degree program under control.

For Phase 1 complete a UML-2 class diagram with descriptions of each class, attribute, service and relationship in hardcopy.

ALL Submissions must be tendered in hardcopy by 5:05 pm in the classroom.

Submissions should follow the form and sequence of elements found in the UML Modeling Template:

http://cis.bentley.edu/lwaguespack/CS630_Site/Downloads_files/Model%20Template.pdf

Diagrams should be "computer drawn" (Visio™, SmartDraw™, PowerPoint, Word, etc.) Descriptions should be word processed.

*Phase 2 **Due April 9, 2014**: Finally, once you think you've got the classes and their relationships and responsibilities down "pat," it's time to model the sequence of class & object interactions that occur to satisfy any of the Use Cases that you modeled for the DRS problem. In the end you should handle three important functions: 1) selecting / scheduling a course in a semester, 2) dropping/adding a course after registration, and 3) performing a degree audit to determine if a DRS indicates that the student has completed the requirements for graduation.*

For Phase 2 complete a revised UML-2 class diagram with descriptions of each class, attribute, service and relationship.

Submit UML-2 use cases and sequence diagrams for three scenarios: 1,2 and 3 above.

*Final Submission**Due April 30, 2014***

This is how object modeling is down in an iterative, circular and elaborative process. You may need to pass your drafts / sketches past Dr. Waguespack for guidance.

Don't be afraid to sketch ideas and then change them as you contemplate the model's "usefulness." It's much easier to refine a weak model than draft a very good one from scratch. Refine, refine, refine!!!!