Planning and Scheduling curriculum integration of BIM with industry input

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BIM ACADEMIC SYMPOSIUM
OBJECTIVE

- Provide construction program graduates with a working knowledge of Building Information Modeling (BIM)

- Help Students develop better understanding of BIM tools, features and functions
METHODOLOGY

- Introduction to Planning and Scheduling (P&S) Concepts
  - In class exercises
  - Guest lectures

- Primavera Training and assignments
  - Assignments to gain experience with Primavera tools

- BIM 4D integration
  - Provide students with an understanding on integrating project Schedule and a 3D model using Synchro
# Course offerings to help integrate BIM in the Construction Management program

<table>
<thead>
<tr>
<th>Course name offered in the Construction program</th>
<th>Topics covered</th>
<th>Future application of these topics for understanding BIM</th>
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| **Year I** Computer Concepts; Computer Applications | - Geometric modeling to represent operations of construction equipment (i.e. a crane, etc.)  
- some form of 3D visualizations | Requirements for productivity, efficiency and safety |
| **Year II** BIM for Construction Management | - Software applications taught in the program: Revit Architecture, Revit Structure, Navisworks, etc. | Learning BIM as a tool for future use |
| **Year III-IV** Project Planning & Scheduling | - Project Scheduling methods such as Bar Charts, CPM and PERT, AOA, AON and CPM techniques; resource allocation and time/cost trade-off and analysis  
- Software used: Primavera P6 R8.2, Synchro for linking schedule to a model and simulations | Creating schedules, and simulating activities in a project example |
Planning & Scheduling Concepts

- Project Scheduling methods
  - Bar Charts
  - CPM and PERT
  - AOA, AON and CPM Techniques
  - Resource Allocation and Resource Leveling
  - Time/cost trade-off and analysis
  - Lean Construction ("push"-"pull" schedules)
Primavera Experiences

- Navigate Project Management module in P6, Create new Projects
- Create work-breakdown structure
- Assign responsible managers to WBS elements
- Add and assign activities and resources
- Generate Project summary reports
P6 Tutorials

The tutorials were created to explain the concepts and software features in a graphical manner. They are self-guided and self-explanatory:

- **Tutorial 1**: Navigating P6
- **Tutorial 2**: Creating a new Project
- **Tutorial 3**: Creating a work-breakdown structure (WBS)
- **Tutorial 4**: Manipulation of activity data

The students are encouraged to go through them in groups of 2-3 individuals and helping each other in their respective teams.
Opening an Existing Layout

You can choose from a number of layouts to present your project from different perspectives. This allows you to spend more time managing projects instead of repeatedly preparing the displays. You can create your own layouts or use global layouts provided by your company.

Now you will open an existing layout.

From the Layout Options bar, choose Layout, Open.

If you make any modifications to the current layout, you will be prompted to save those changes before opening a new layout. In most cases, you will choose No.
If you ever add a WBS element to the wrong order, you can use the indentation keys to adjust. The WBS element you are now adding should really be a third level element. Use the indentation key to move it from the fourth level to the third level.
BIM Requirements

Develop and understanding of:

- BIM use and how it aids in the interaction of various project stakeholders
- Knowledge of BIM software
- Management skills to facilitate the BIM process
- Understanding of the trades/systems that frequently contribute in the BIM process
Example of the project modeled with Synchro
Synchro 4D Integration

- Import pertinent Information
  - Schedules, Data Date, Gantt Display, Importing 3D Models, DWF Model Files, 3D Resources Creation, Equipment Models.

- Link 3D model to the project schedule

- Synchronize Schedule
  - Compare baseline Schedule against updates.
  - Create AVI of comparison for sharing and review purpose.
Comparison of baseline with updated schedule through 3D views
Outcomes and assessment

There is further need to do the following:

1. BIM development – no ACCE accreditation requirements
2. BIM uses and interactions among various project stakeholders
3. Sort of BIM software – adoption of Synchro features and capabilities for Project Planning and Scheduling class
4. Selected applications presented with industry speakers
5. Management skills to facilitate the BIM process
6. Understanding how trades/systems contribute in the BIM process (if available time)

Currently, the industry expects CM graduates to be aware of systems construction and methods and have along a certain level of modeling competency.
CONCLUSIONS

• Implement BIM throughout the curriculum
  ◦ In various courses - Estimating, Scheduling, Facilities Management

• Bridge the gap between the Academia and Industry

• Improve student performance
  ◦ Group projects
  ◦ Guest Lecturers
  ◦ Self Paced Learning – Tutorials: Primavera & Synchro, with understanding effects on trades implications, schedule usage
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Thank you!