Built Environment

CONS0005
Construction Informatics

Ahmed WA Hammad
Disclaimer
This abbreviated course outline is indicative of the outcomes, delivery and assessment. While Course Learning Outcomes will remain constant, other details may be subject to change. The full and most accurate course outline will be available in Moodle.

1. COURSE STAFF

<table>
<thead>
<tr>
<th>Course Convenor</th>
<th>Ahmed WA Hammad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td><a href="mailto:A.Hammad@unsw.edu.au">A.Hammad@unsw.edu.au</a></td>
</tr>
</tbody>
</table>

2. COURSE DETAILS

Credit Points: 6 UoC

<table>
<thead>
<tr>
<th>Learning Activity</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>1</td>
</tr>
<tr>
<td>Computer Lab</td>
<td>3</td>
</tr>
<tr>
<td>Online learning activity</td>
<td>1</td>
</tr>
</tbody>
</table>

Description
This course introduces and applies Information Communication Technologies (ICT) and Building Information Modelling (BIM) in the construction management discipline. This course offers knowledge and skills essential for successful adoption of ICT and BIM in construction planning, construction cost management, design coordination and modelling. ICT and BIM competences are becoming core requirements for design and construction professionals; this course covers the challenges and case studies of the adoption of ICT and BIM in the construction industry. It is structured around lectures, laboratory tutorial sessions; and assessment is based on both individual and group work.

Program Learning Outcomes (PLOs)
1. Demonstrate an advanced understanding of the applications of BIM for construction project management field.
2. Apply BIM principles and practices to solve complex construction project management problems.
3. Complete a project that involves substantial scholarship, particularly in the adoption of BIM for construction project management.
4. Critically evaluate contemporary literatures in BIM based construction management.
5. Demonstrate a high level of personal autonomy and accountability in the acquisition or application of knowledge or skills related to BIM.
6. Demonstrate an understanding of international perspectives relevant to BIM in construction management and the construction industry.
7. Demonstrate an understanding of, and the ability to apply, the principles of teamwork and collaboration using IPD and BIM approaches.
8. Demonstrate environmental and social responsibility, and a respect for diversity using BIM approaches.
Course Learning Outcomes (CLOs) with Alignment to PLOs and Assessment

<table>
<thead>
<tr>
<th>CLO #</th>
<th>CLO Statement</th>
<th>PLO #</th>
<th>Related Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLO 1</td>
<td>Create 3D BIM models</td>
<td>1,2,3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>CLO 2</td>
<td>Generate 4D simulations and utilise them for construction planning and control on site</td>
<td>1,2,3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>CLO 3</td>
<td>Produce automated cost estimates using 5D BIM principle</td>
<td>1,2,3,5</td>
<td>1,2</td>
</tr>
<tr>
<td>CLO 4</td>
<td>Minimise risks and potentials for disputes in construction using BIM</td>
<td>3,4,7,8</td>
<td>3,4</td>
</tr>
<tr>
<td>CLO 5</td>
<td>Work collaboratively and communicate effectively with allied professionals using BIM</td>
<td>3,4,5,7,8</td>
<td>3,4</td>
</tr>
</tbody>
</table>

3. ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Weight</th>
<th>CLOs Assessed</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Computer lab exercises</td>
<td>10%</td>
<td>1, 2, 3, 4, 5</td>
<td>W2-W8</td>
</tr>
<tr>
<td>2. online quizzes</td>
<td>20%</td>
<td>1, 2, 3, 4, 5</td>
<td>W4, W8</td>
</tr>
<tr>
<td>3. Project-based learning</td>
<td>50%</td>
<td>1, 2, 3, 4, 5</td>
<td>W10</td>
</tr>
<tr>
<td>4. Reflective essay</td>
<td>20%</td>
<td>1, 2, 3, 4, 5</td>
<td>W12 (during exam period)</td>
</tr>
</tbody>
</table>

4. WEEKLY COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Activity</th>
<th>Related CLOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>• IPD &amp; BIM</td>
<td>• Pre-class online lecture on IPD &amp; BIM</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>• Project-based assignment</td>
<td>• Discussions on project-based assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BIM modelling</td>
<td>• Pre-class online lecture on 3D BIM modelling</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lab exercise on 3D BIM modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Remote learning of 3D BIM with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Online forum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pre-class online lecture on 3D BIM - creating custom families</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lab exercise on 3D BIM modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Remote learning of 3D BIM with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Online forum</td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>BIM- creating custom families</td>
<td>• Pre-class online lecture on 3D BIM with video tutorial support</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lab exercise on sustainability analysis using BIM</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Activity</td>
<td>Events</td>
<td>References</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>5</td>
<td>Cost estimating using BIM</td>
<td>- Pre-class online lecture on Cost Estimating using BIM</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lab exercise on Cost estimating with BIM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remote learning of BIM cost estimating with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction BIM modelling</td>
<td>- Pre-class online lecture on Construction BIM modelling</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lab exercise on Construction BIM modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remote learning of Construction BIM with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Design coordination using BIM</td>
<td>- Pre-class online lecture on Design coordination using BIM</td>
<td>2,4,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lab exercise on design coordination with BIM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remote learning of BIM design coordination with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Safety analysis with BIM</td>
<td>- Pre-class online lecture on Construction BIM modelling</td>
<td>2,4,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lab exercise on Construction BIM modelling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Remote learning of Safety BIM with video tutorial support</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online quiz 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Managing BIM implementation challenges</td>
<td>- Pre-class online lecture on Managing BIM implementation challenges</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Project-based assignment draft review</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Project-based assignment submission</td>
<td>- Assignment presentation</td>
<td>1,2,3,4,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Online forum</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Project-based assignment submission</td>
<td>- Assignment presentation</td>
<td>1,2,3,4,5</td>
</tr>
</tbody>
</table>