



**TAYLOR'S UNIVERSITY**

Wisdom • Integrity • Excellence

---

**BACHELOR OF SCIENCE (HONOURS) IN ARCHITECTURE**

**BUILDING CONSTRUCTION 2  
(BLD 60703/ ARC 2513)**

**MODULE OUTLINE**

**March 2017**



**SCHOOL OF ARCHITECTURE, BUILDING AND DESIGN**  
**Centre for Modern Architecture Studies in Southeast Asia**

<b>Programme</b>	Bachelor of Science (Honours) in Architecture
<b>Module</b>	BUILDING CONSTRUCTION II/2 (BLD60703/ARC2513)
<b>Prerequisite</b>	None
<b>Credit Hours</b>	3
<b>Classification</b>	Core
<b>Instructors</b>	Mohamed Rizal Mohamed (603-56295624 <a href="mailto:MohamedRizal.Mohamed@taylors.edu.my">MohamedRizal.Mohamed@taylors.edu.my</a> ) Ar. Edwin Chan Yean Liong Sujatavani Gunasagaran

---

### Module Synopsis

The subject aims to introduce structures as architecture by developing an understanding of the structural systems in construction technology in a unique way in relation to historical and innovative buildings. Skeletal, solid and surface construction systems are discussed and analyzed in terms of load and forces in a general term. Projects based on topics covered during lectures provide students with the opportunity to apply knowledge gained as well as to further enhance their understanding of the topics.

### Module Teaching Objectives

The teaching objectives of the module are to:

1. To develop an understanding of the structural systems in construction and its application in the building construction.
2. To identify and apply knowledge of load and forces in analyzing structural possibilities in the structural systems as part of the construction process

### Module Learning Outcomes (MLO)

The objectives of the module are translated into a number of Module Learning Outcomes (MLO), mapped to Programme Learning Outcomes (PLO) and Taylor's Graduate Capabilities (TGC).

No.	MLO	PLO	TGC
1	Identify basic structural systems in construction.	3	1.1 2.2 7.1
2	Recognize the implication of construction systems in design.	3	1.1 3.1
3	Able to compare the different type construction systems.	3	1.1 2.2 3.2
4	Apply construction systems in design.	1,3	2.2 3.2 7.1
5	Differentiate construction systems in terms of loads and forces acting on its structural elements.	3,5	2.2 5.1
6	Analyze the issues of strength, stiffness and stability of structures including modes of structural systems, forces, stress and strain and laws of static.	3	2.2 3.1 5.1

## Modes of Delivery and TIMeS

This is a 3 credit hour module conducted over a period of 12 weeks. The modes of delivery will be in the form of lectures, discussion/tutorials, and self-directed study. The breakdown of the contact hours is as follows:

Lecture:	2 hours/week
Tutorial:	2 hours/week
Self-Study:	4 hours/week

TIMeS will be used as a communication tool and information portal for students to access module materials, project briefs, assignments and announcements.

## Programme Learning Outcomes (PLO)\*









The Bachelor of Science (Honours) in Architecture programme has as its objectives that graduates exemplify the following Programme Learning Outcomes (PLO) that will enable them to:

No.	Programme Learning Outcomes (PLO)
1	Produce designs at appropriate complexity and scales up to the schematic level using appropriate communication tools
2	Demonstrate understanding of cultural, historical and established architectural theories, philosophies and context
3	Demonstrate creativity, innovation and imagination and translate these into an architectural design solution
4	Develop design to a level for regulatory application for Building Plan submission that complies to the requirements of local authorities, including understanding of building regulations, basic building construction and materials, environmental considerations and building services
5	Translate design into construction drawings with appropriate construction details and use established architectural drawing convention
6	Work in a team and participate in the design process

\*Source: *The Manual of Accreditation for Architecture Programmes, Board of Architects Malaysia, 2013*

## Taylor's Graduate Capabilities (TGC)

The teaching and learning approach at Taylor's University is focused on developing the Taylor's Graduate Capabilities (TGC) in its students; capabilities that encompass the knowledge, cognitive capabilities and soft skills of its graduates.

Taylor's Graduate Capabilities (TGC)	
	<b>1. Discipline Specific Knowledge</b> 1.1 Able to put theories into practice 1.2 Understand ethical issues in the context of the field of study 1.3 Understand professional practice within the field of study
	<b>2. Lifelong Learning</b> 2.1 Learn independently 2.2 Locate, extract, synthesize and utilize information effectively 2.3 Be intellectual engaged
	<b>3. Thinking and Problem Solving skills</b> 3.1 Think critically and creatively 3.2 Define and analyze problems to arrive at effective solutions
	<b>4. Communication Skills</b> 4.1 Communicate appropriately in various settings and modes
	<b>5. Interpersonal Skills</b> 5.1 Understand team dynamics and mobilize the power of teams 5.2 Understand and assume leadership
	<b>6. Intrapersonal Skills</b> 6.1 Manage oneself and be self-reliant 6.2 Reflection one's action and learning 6.3 Embody Taylor's core values
	<b>7. Citizenship and Global Perspectives</b> 7.1 Be aware of and form opinions from diverse perspectives 7.2 Understand the value of civic responsibility and community engagement
	<b>8. Digital Literacy</b> 8.1 Effective use of ICT and related technology

## Types of Assessments and Feedback

You will be graded in the form of formative and summative assessments. Formative assessment involves participation in discussions and feedback sessions. Summative assessment will inform you about the level of understanding and performance capabilities achieved at the end of the module.

No.	Assessment Components	Type	MLO	Weightage
1	<b>Skeletal Construction "Temporary Bus Shelter"</b>	Summative	1, 2, 4	30%
2	<b>Construction Model (Tensile/ Grid Shell/ Air Supported Structure)</b>	Summative	3, 5, 6	40%
3	Final Examination	Summative	3, 5	30%
4	Taylor's Graduate Capabilities Portfolio	Formative	1, 2, 3	Pass/Fail
Total				100%

## **Assessment Components**

### **1. Project 1: Skeletal Construction “Temporary Bus Shelter”**

Students will be required to produce a shelter based on the understanding of skeletal construction and its joints. It should be made out of specific recycle materials that reflects the materials used in actual construction. The shelter will be tested to determine its strength and students will be required to analyze the success or failure of their shelter. Analysis should indicate the students understanding of skeletal construction, its joints, loads and forces experienced in a skeletal structure.

### **2. Project 2: Construction Model**

The project will be based on the concept taught in class which is grid shell and tensile construction methods. It will involve a relevant case study of a building of the student's choice. Students will be required to dissect a model of their choice and come up with an analysis of the construction methods used in the building. The students' analysis should comprise structural system, material, function and load distribution in the building.

### **3. Final Examination**

The final examination is designed to assess the ability of the students in solving material-design issues, appropriate material-occupancy specification and understanding of material properties of materials and technical issues related to building materials. The format of the assessment will be informed later.

### **4. Taylor's Graduate Capabilities Portfolio (TGCP)**

The Taylor's Graduate Capabilities Portfolio is a document that collates all assessments produced in a module and reflects a student's acquisition of the Module Learning Outcomes and Taylor's Graduate Capabilities. Each student is to develop an ePortfolio, a web-based portfolio in the form of a personal academic blog. The ePortfolio is developed progressively for all modules taken throughout Semesters 1 to 5, and culminates with a final Portfolio in printed form produced in the final semester. The printed Portfolio must encapsulate the acquisition of Programme Learning Outcomes and Taylor's Graduate Capabilities, and showcase the distinctiveness and identity of the student as a graduate of the programme.

## Marks and Grading Table

Assessments and grades will be returned within two weeks of your submission. You will be given grades and necessary feedback for each submission. The grading system is shown below:

Grade	Marks	Grade Points	Definition	Description
A	80 – 100	4.00	Excellent	Evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of module matter; evidence of extensive knowledge base.
A-	75 – 79	3.67	Very Good	Evidence of good grasp of module matter; critical capacity and analytical ability; understanding of relevant issues; evidence of familiarity with the literature.
B+	70 – 74	3.33	Good	Evidence of grasp of module matter; critical capacity and analytical ability, reasonable understanding of relevant issues; evidence of familiarity with the literature.
B	65 – 69	3.00		
B-	60 – 64	2.67	Pass	Evidence of some understanding of the module matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
C+	55 – 59	2.33		
C	50 – 54	2.00		
D+	47 – 49	1.67	Marginal Fail	Evidence of nearly but not quite acceptable familiarity with module matter, weak in critical and analytical skills.
D	44 – 46	1.33		
D-	40 – 43	1.00		
F	0 – 39	0.00	Fail	Insufficient evidence of understanding of the module matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.
WD	-	-	Withdrawn	Withdrawn from a module before census date, typically mid-semester [refer to Description 1 below].
F(W)	0	0.00	Fail	Withdrawn after census date, typically mid-semester [refer to Description 2 below].
IN	-	-	Incomplete	An interim notation given for a module where a student has not completed certain requirements with valid reason or it is not possible to finalise the grade by the published deadline.
P	-	-	Pass	Given for satisfactory completion of practicum.
AU	-	-	Audit	Given for a module where attendance is for information only without earning academic credit.

Description 1: Week 3 to week 7 (inclusive) for long semester, or week 3 to week 5 (inclusive) for short semester. A short semester is less than 14 weeks. Not applicable for audit and internship.

Description 2: After week 7 for long semester, or after week 5 for short semester. A short semester is less than 14 weeks. Not applicable for audit and internship.

### Coursework Assessments and Final Examination

A student who fails to attempt all assessment components worth 20% or more, including final exam and final presentation, will result in failing the module irrespective of the marks earned, even though he/she has achieved 50% or more in the overall assessment. Student will not be allowed to resit the examination (or resubmit an assessment).

**Module Schedule** (subject to change at short notice)

Date/Week	Lecture/Presentation	Discussion/Tutorial	Self-directed Study
	Hours	Hours	Hours
29 Mac MR	General introduction: <b>Introduction to Building Construction 2</b>	Briefing Project 1: <b>“Temporary Bus Shelter”</b>	Project 1
Week 1	2	2	4
5 Mac EC	<b>Understanding of Loads and Forces</b> <ul style="list-style-type: none"> <li>• Dead and live load.</li> <li>• Compression, tension, shear, torque, bending, forces.</li> <li>• Moment.</li> <li>• Stress.</li> <li>• Internal resisting force.</li> <li>• Depth / geometry.</li> </ul>	Group discussion and consultation	Project 1
Week 2	2	2	4
12 April EC	<b>Frame structure (Steel and Timber)</b> <ul style="list-style-type: none"> <li>• Three identifying elements: column, beam and struts</li> <li>• Design approaches.</li> <li>• Precedents.</li> <li>• Metal, iron, wrought iron, cast iron, steel, trusses</li> <li>• Portal frame</li> <li>• Timber, traditional construction, trusses, details</li> </ul>	Group discussion and consultation	Project 1
Week 3	2	2	4
19 April EC	<b>Grid structures</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Elements and components</li> <li>• Types of grid structures</li> </ul>	Group discussion and consultation	Project 1
Week 4	2	2	4
26 April SG	<b>Suspension structures</b> Tensile construction <ul style="list-style-type: none"> <li>• Elements and components</li> <li>• Design approaches</li> <li>• Precedents</li> <li>• Membrane structure</li> <li>• Limitations</li> </ul> Air Supported Construction <ul style="list-style-type: none"> <li>• Distribution of loads</li> <li>• Air-inflated structures</li> <li>• Design approaches</li> <li>• Precedents</li> <li>• Limitations</li> </ul>	Group discussion and consultation	Project 1
Week 5	2	2	4
3 May	<b>Interim Review Project 1</b>	<b>Interim Review Project 1</b>	Project 1
Week 6	2	2	4
10 May	<b>Public Holiday (Wesak Day)</b>		
Week 7	<b>(8 hours of self-directed studies)</b>		

Date/Week	Lecture/Presentation	Discussion/Tutorial	Self-directed Study
	Hours	Hours	Hours
<b>Mid-semester Break &amp; Activity Week (8 hours of self-directed studies)</b>			
24 May	<b>Presentation &amp; Submission of Project 1</b>		
Week 8	2	2	-
31 May SG	<b>Shells and Folded slab roof structure</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Shell Construction</li> <li>• Folded slab</li> <li>• Elements and components</li> <li>• Design approaches</li> <li>• Precedents</li> </ul>	<b>Briefing Project 2: Understanding Forces in Building Constructions</b> Group discussion and consultation	<b>Project 2</b>
Week 9	2	2	4
7 Jun SG	<b>Load Bearing structure</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Characteristics</li> <li>• Advantages and disadvantages</li> <li>• Construction method</li> </ul>	Group discussion and consultation	<b>Project 2</b>
Week 10	2	2	4
14 Jun MR	<b>Basement</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Construction methods</li> <li>• Retaining wall</li> <li>• Water proofing</li> <li>• Drainage</li> <li>• Ramps</li> </ul>	Group discussion and consultation	<b>Project 2</b>
Week 11	2	2	4
21 Jun	<b>Interim Review Project 2</b>		-
Week 12	2	2	4
<b>Hari Raya Break (8 hours of self-directed studies)</b>			
5 Jul	<b>Submission of Project 2</b>		TGC Portfolio
Week 13	-	-	2
12 Jul	<b>Submission: TGC Portfolio</b>		-
Week 14	-	-	-
TBC	<b>Study Week</b>	<b>Study Week</b>	<b>Preparation time</b>
Week 15	-		8
TBC	<b>Final Exam</b>		
Week 16	2		

## References

1. Charleson, Andre W., 2006, Structure as Architecture. Architectural Press, UK
2. Ching, Francis D.K. 1991. Building Construction illustrated. New York. Van Nostrand Reinhold.
3. Orton, Andrew. 2001, The Way We Build Now: Form Scale and Technique. Spon Press, London. Spon Press
4. Lyall, Sutherland, 2002. Remarkable Structures: Engineering Today's Innovative Buildings. Princeton Architectural Press, New York.
5. Simmon, H. Leslie. 2001. Construction: Principles, Materials and Method. 7th Edition. New York. John Wiley & Sons.
6. Wihide, Elizabeth. 2001. Materials: A Directory for Home Design. Quadrille Publishing Ltd, London.



## **GENERAL RULES AND REGULATIONS**

### **Student-centered Learning**

The module uses the Student-centered Learning (SCL) approach. Utilization of SCL embodies most of the principles known to improve learning and to encourage student's participation. SCL requires students to be active, responsible participants in their own learning and instructors are to facilitate the learning process. Various teaching and learning strategies such as experiential learning, problem-based learning, site visits, group discussions, presentations, working in group and etc. can be employed to facilitate the learning process. In SCL, students are expected to be:

- active in their own learning;
- self-directed to be responsible to enhance their learning abilities;
- able to cultivate skills that are useful in today's workplace;
- active knowledge seekers;
- active players in a team.

### **Attendance and Student Participation**

Attendance is compulsory. Any student who arrives late after the first half-hour of class will be considered as absent. The lectures and tutorials will assist you in expanding your ideas and your assessments. A minimum of 80% attendance is required to pass the module and/or be eligible for the final examination and/or presentation.

Students will be assessed based on their performance throughout the semester. Students are expected to attend and participate actively in class. Class participation is an important component of every module. Your participation in the module is encouraged. You have the opportunity to participate in the following ways:

- Your ideas and questions are welcomed, valued and encouraged.
- Your input is sought to understand your perspectives, ideas and needs in planning module revision.
- You have opportunities to give feedback and issues will be addressed in response to that feedback.
- Do reflect on your performance in Portfolios.
- Student evaluation on your views and experiences about the module are actively sought and used as an integral part of improvement in teaching and continuous improvement.

### **Late Submission Penalty**

The School imposes a late submission penalty for work submitted late without a valid reason e.g. a medical certificate. Any work submitted after the deadline (which may have been extended) shall have the percentage grade assigned to the work on face value reduced by 10% for the first day and 5% for each subsequent day late. A weekend counts as one (1) day.

Individual members of staff shall be permitted to grant extensions for assessed work that they have set if they are satisfied that a student has given good reasons.

Absenteeism at intermediate or final presentation will result in zero mark for that presentation.

The Board of Examiners may overrule any penalty imposed and allow the actual mark achieved to be used if the late submission was for a good reason.

## **Plagiarism**

Plagiarism, which is an attempt to present another person's work as your own by not acknowledging the source, is a serious case of misconduct which is deemed unacceptable by the University.

"Work" includes written materials such as books, journals and magazine articles or other papers and also includes films and computer programs. The two most common types of plagiarism are from published materials and other students' works.

### **1. Published Materials**

In general, whenever anything from someone else's work is used, whether it is an idea, an opinion or the results of a study or review, a standard system of referencing should be used. Examples of plagiarism may include a sentence or two, or a table or a diagram from a book or an article used without acknowledgement.

Serious cases of plagiarism can be seen in cases where the entire paper presented by the student is copied from another book, with an addition of only a sentence or two by the student.

While the former can be treated as a simple failure to cite references, the latter is likely to be viewed as cheating in an examination.

Though most assignments require the need for reference to other peoples' works, in order to avoid plagiarism, students should keep a detailed record of the sources of ideas and findings and ensure that these sources are clearly quoted in their assignment. Note that plagiarism also refers to materials obtained from the Internet too.

### **2. Other Students' Works**

Circulating relevant articles and discussing ideas before writing an assignment is a common practice. However, with the exception of group assignments, students should write their own papers. Plagiarising the work of other students into assignments includes using identical or very similar sentences, paragraphs or sections. When two students submit papers that are very similar in tone and content, both are likely to be penalised.

### **Guide for Writing References:**

- [http://taylorslibrary.taylors.edu.my/user\\_skills/user\\_support\\_students](http://taylorslibrary.taylors.edu.my/user_skills/user_support_students)

**Prepared by:**

Mohamed Rizal Mohamed



.....  
Date: 27<sup>th</sup> March 2017

Email: MohamedRizal.Mohammed  
@taylors.edu.my

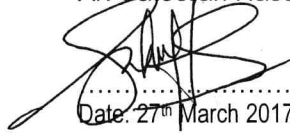
Office No.: 603-56295624

Office Location: Academic Suite C5

Module Coordinator

**Checked by:**

Ar. Sateerah Hassan



.....  
Date: 27<sup>th</sup> March 2017

Stream Coordinator  
(Technical Studies)

**Approved by:**

Mohd Adib Ramli



.....  
Date: 27<sup>th</sup> March 2017

Programme Director

**Remarks:**

1. The Module Outline is to be distributed to the students in the first week of the semester.
2. Any changes to the Module Outline shall be communicated (in writing) to the Programme Director and the approved revised version must be communicated to the students