



UNIVERSITI TEKNOLOGI MARA

BCT485: DETERIORATION AND PROTECTION OF BIO-COMPOSITES MATERIALS

Course Name (English)	DETERIORATION AND PROTECTION OF BIO-COMPOSITES MATERIALS APPROVED
Course Code	BCT485
MQF Credit	3
Course Description	Natural durability of wood and various types of deterioration and decay of wood and bio-composites during processing and service are discussed. Students are introduced to methods of wood and bio-composites protection focusing on the industrial preservative treatment. Exposure and hands-on on physical principles of kiln drying, industrial drying technologies, drying defects, treatment and prevention are realised in laboratory and industrial visits.
Transferable Skills	Student are able to transfer skills on how to treat and preserve solid wood for protection.
Teaching Methodologies	Lectures, Lab Work, Field Trip
CLO	<p>CLO1 Identify drying defects and describe methods for minimization or prevention of wood/bio-composite materials from drying defects. (LO1; LO3-CTPS3; C2;A3)</p> <p>CLO2 Describe physical principles of kiln-drying of wood materials and industrial wood drying processes. (LO1; C2; A3)</p> <p>CLO3 Identify and classify types of deterioration caused by biological and high temperature degradation. (LO1; C4; A3)</p> <p>CLO4 Categorised different types of wood protection treatment and industrial preservative treatment types caused by biological agents. (LO1; LO3-CTPS3; C5; A3)</p> <p>CLO5 Perform treatment of wood for protection at laboratory scale and analyse laboratory data. (LO1; LO2; LO3-CTPS3; LO4-CS3; LO5-TS3; LO9-LS2; C4; P4; A4)</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. Tools, techniques and terminology 1.1) 1.1 Introduction 1.2) 1.2 The lab analysis of deterioration 1.3) 1.3 The general technique in protection	
2. Drying processes 2.1) 2.1 Physical principles of air and kiln-drying 2.2) 2.2 Natural defects and drying defects 2.3) 2.3 Kiln-Drying Methods 2.4) 2.4 Basic structures of kilns 2.5) 2.5 Practical procedures in drying 2.6) 2.6 Drying defects and its prevention	
3. Preservation processes 3.1) 3.1 Deterioration by fungi, insects and marine borers 3.2) 3.2 High temperature degradation 3.3) 3.3 Sapwood and natural durability 3.4) 3.4 Protection against deterioration 3.5) 3.5 Preservative types 3.6) 3.6 Major industrial treating processes.	

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	n/a	10%	CLO1 , CLO2 , CLO3 , CLO4 , CLO5
	Practical	n/a	15%	CLO1 , CLO2 , CLO3 , CLO4 , CLO5
	Quiz	n/a	5%	CLO1 , CLO2 , CLO3 , CLO4 , CLO5
	Test	n/a	30%	CLO1 , CLO2 , CLO3 , CLO4 , CLO5

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> • Pratt, G.H 1997, <i>Timber Drying Manual</i>, 3rd Ed., 1-11, BRE Press(Building Research Establishment) United Kingdom [ISBN: 1 86081 124 8] • Schmidt, O 2006,). <i>Wood Wood and Tree Fungi. Biology, Damage, Protection and Use</i>, Springer-Verlag Berlin Heidelberg New York New York [ISBN: 978-3-540-321] • Rod A. Eaton, Mike D. C. Hale 1993, <i>Wood. Decay, Pests and Protection</i>, 1st Ed., 1-22, Chapman & Hall London [ISBN: 0412531208] • Bowyer, J.L, Shmulsky, R and Haygreen, J.G. 2007, <i>Forest Products & Wood Science. An Introduction</i>, 5th Ed., 11, Blackwell USA; UK: Australia [ISBN: 13:978-0-8138] • Lew Wing-Hing 1990, <i>Timber Drying. Introduction. A technical Review</i>, 4, Asean Timber Technology Centre (ATTC) [ISBN: 0116705213] • Franco Bulian, Jon Graystone 2009, <i>Wood Coatings. Theory and Practice</i>, 1st Ed., 2nd, Elsevier Amsterdam [ISBN: 9780444528407] • Callum A. S. Hill 2007, <i>Wood Modification</i>, John Wiley & Sons [ISBN: 0470021721]
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources