



UNIVERSITI TEKNOLOGI MARA

PMA650: PRINTING PROCESS CONTROL

Course Name (English)	PRINTING PROCESS CONTROL APPROVED
Course Code	PMA650
MQF Credit	4
Course Description	This course is intended to guide and help the student to understand an important of process and quality control aspects in offset lithography. It is important to understand and consider process control not as prepress, plate making and printing, but as an integrated process which can only be successful if there is good communication and control at each stage of the process. To be able to specify and control effectively, the students must understand some of the fundamental principles related to our ability to actually see color. They should understand the principles and theory of color reproduction in offset lithography, plate making procedures and pressrun operation. The element of measurement also will be an important procedure in order to get a good quality in offset lithography operation. Students also will learn how to use a standard and specification for the process control.
Transferable Skills	process control
Teaching Methodologies	Lectures, Lab Work, Workshop
CLO	CLO1 Explain the theory of process control in Offset Lithography printing. CLO2 Examine specifications and standards in the printing industry for quality and process control. CLO3 Demonstrate the principles and basic requirements of process control that involves both equipment and material.
Pre-Requisite Courses	No course recommendations
Topics	
1. Fundamentals of Color and Color Vision 1.1) 1.1 Color and Light 1.2) 1.2 Color Vision and Perception 1.3) 1.3 Color Vision Testing 1.4) 1.4 Viewing Condition	
2. Color Definition and Measurement 2.1) 2.1 Defining Colors 2.2) 2.2 Color Definition by Physical Sample 2.3) 2.3 Color Definition by Measurement 2.4) 2.4 CIE Color Standard Observer 2.5) 2.5 Color Measuring Instrument	
3. Density and Densitometers 3.1) 3.1 What is Density? 3.2) 3.2 Principle of Measurement 3.3) 3.3 Using the Densitometer 3.4) 3.4 Other Type of Measurement 3.5) 3.5 High Fidelity (Hi-Fi) Color Printing	
4. Color Reproduction Principles 4.1) 4.1 Additive Color Mixture 4.2) 4.2 Subtractive Color Mixture 4.3) 4.3 Inks for Color Reproduction 4.4) 4.4 Color Correction 4.5) 4.5 Gray Balance and Tone Reproduction 4.6) 4.6 The Black Printer	

5. Color Reproduction as a Total System 5.1) 5.1 A Systematic Approach 5.2) 5.2 Specifications and Controls
6. The Print Characteristics 6.1) 6.1 Print Characteristic Definition 6.2) 6.2 Print Characteristic Attributes 6.3) 6.3 Print Characteristic Specification
7. Measurement of Print Characteristic 7.1) 7.1 Print Control Strips 7.2) 7.2 Tone Transfer Control Elements 7.3) 7.3 Slur and Doubling Elements 7.4) 7.4 Dot Area Measurement 7.5) 7.5 Trapping Measurement 7.6) 7.6 Hue Error and Grayness Measurement 7.7) 7.7 Color Contrast 7.8) 7.8 Gray Balance Measurements
8. Control of Platemaking 8.1) 8.1 Basic Objectives 8.2) 8.2 Variables Affecting Image Transfer 8.3) 8.3 Plate Control Elements 8.4) 8.4 Establishing the Correct Exposure
9. Controlling the Print Characteristic 9.1) 9.1 Prepress influences on dot gain 9.2) 9.2 Causes of Dot Gain Variation in Printing 9.3) 9.3 Factors Affecting Trapping 9.4) 9.4 Factors Determining Color Sequence 9.5) 9.5 A Standard Color Sequence
10. Proofing Methods and Control 10.1) 10.1 Stages of Proofing 10.2) 10.2 Methods of Proofing 10.3) 10.3 Analog Off-press Proofs 10.4) 10.4 Digital Proofing System 10.5) 10.5 Calibration of Proof to Production
11. Establishing Standards and Specification 11.1) 11.1 Standardize Basic Process Variables 11.2) 11.2 Ensuring Press Condition 11.3) 11.3 Categorization of Substrates 11.4) 11.4 Dot Gain and density Targets 11.5) 11.5 The Repro Specification 11.6) 11.6 ISO Standard for Graphic Arts 11.7) 11.7 CGATS 11.8) 11.8 GRACoL 11.9) 11.9 SWOP
12. Controlling the Production Run 12.1) 12.1 Characteristic of a Litho Inking System 12.2) 12.2 Process Variability 12.3) 12.3 Strategies for Control
13. Quality Issues 13.1) 13.1 Quality Assurance 13.2) 13.2 Print Demerits 13.3) 13.3 Process Control 13.4) 13.4 Quality Paradigm
14. Case Study 14.1) 14.1 Press Run Analysis 14.2) 14.2 Process Control and Color Quality Club

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Individual Project	Selected problem and apply suitable standard of process in order to solve the problem effectively. Collaboration between students is required to develop templates of social relationships and train their social skills.	60%	CLO3
	Test	Test with short answer to show their knowledge and skills	20%	CLO1
	Written Report	Report assignment on certain topic and issues to analyze creative, innovative and effective solution to printing problems	20%	CLO2

Reading List	Recommended Text
	<ul style="list-style-type: none"> • Tom P. Ashe 2014, <i>Color management & quality output : working with color from camera to display to print</i> [ISBN: 9780240821115] • Edith Anderson Feisner, Ronald Reed 2013, <i>Color Studies</i>, A&C Black [ISBN: 1609015312] • Jeff Schewe 2013, <i>The Digital Print</i>, Pearson Education [ISBN: 0321908457] • R. W. G. Hunt, M. R. Pointer 2011, <i>Measuring Colour</i>, John Wiley & Sons [ISBN: 9781119975373] • Phil Green 2010, <i>Copy Details Color management : understanding and using ICC profiles</i> [ISBN: 9780470058251] • Jan-Peter Homann 2008, <i>Digital Color Management</i>, Springer Science & Business Media [ISBN: 9783540693772]

Article/Paper List	This Course does not have any article/paper resources
---------------------------	---

Other References	This Course does not have any other resources
-------------------------	---