國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：溫照華

Instructor:Chao-Hua Wen

課程名稱：彩色材料之光學特性與應用

Course Title：Optical Properties of Colored Materials

2026/11/4

課程代號： CI5318701 Course Code 學分數： 3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	W6(華夏恆毅樓D406) W7(華夏恆毅樓D406) W8(華夏恆毅樓D406)
專業核心能力： Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	On completion of this module, students will be able to: i) relate the optical properties of opaque and semi-transparent mixtures of coloured materials to the properties and amounts of the individual constituent components; ii) prepare calibration panels for the characterization of the optical properties of opaque and semi-transparent materials; iii) establish colour management and colour control procedures for the production and use of coloured materials in the laboratory and in industry; iv) use computer based colour match prediction systems for colour matching and colour correction.
課程大綱： Outline of Lectures	1) Light and Color 2) Color Due to Refraction and Dispersion 3) The Production of Color by Reflection 4) Polarization and crystals 5) Color Due to Scattering and Diffraction 6) Color from Atoms and Ions 7) Color from Molecules 8) Color From Charge Transfer and Luminescence 9) Color in Metals, Semiconductors and Insulators 10) Fiber Optics and Data Transmission 11) Light-Sensitive Materials 12) Computer based methods of color match prediction and color match correction 13) Applications: color filter, LED, backlight unit, de-mosaic color for Digital camera/Scanner, digital half-toning for printer, color e-paper.
授課方式： Method of Instruction	講授 Lecture：80% 分組討論 Group discussion：10% 案例研討 Case study：0% 操做練習 Practical exercises：10% 講授 Lecture：%

教科書： Textbooks	[1] Colour and Optical Properties of Materials, Richard J.D. Tilley, Second Edition, John Wiley & Sons (2011)
參考書目： References	[1] The Physics and Chemistry of Color: An Exploration of the Relationship Between Light, the Optical Properties of Materials, 2nd ed., Kurt Nassau, Wiley-Interscience, 2001. [2] Materials Science and Engineering: An Introduction , 10th ed., William D. Callister, JR and David G. Rethwisch, Wiley, 2018. [3] Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd ed., Günther Wyszecki and W. S. Stiles, Wiley-Interscience 2000.
修課須知： Notice	Finding a volunteer TA from within the course.
評量方式： Grading	1) Assignment: 2 problem/quiz set (30%) 2) Midterm project review (30%) 3) Final-term project report: oral & paper (40%)
備註說明： Notes	None.