# 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

2026/5/5

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| 課程代號： CI5318701<br>Course Code<br>學分數： 3<br>Credits | 必選修：選修/半學年<br>Required/Electve:Elective/Half Yr.<br>先修課程：<br>Prerequisites |
| 節次教室：<br>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：<br>Core Professional Competencies | |
| 課程網址：<br>Course Website | |
| 課程宗旨：<br>Course Objectives | On completion of this module, students will be able to:<br>i) relate the optical properties of opaque and semi-transparent mixtures of coloured materials to the properties and amounts of the individual constituent components;<br>ii) prepare calibration panels for the characterization of the optical properties of opaque and semi-transparent materials;<br>iii) establish colour management and colour control procedures for the production and use of coloured materials in the laboratory and in industry;<br>iv) use computer based colour match prediction systems for colour matching and colour correction. |
| 課程大綱：<br>Outline of Lectures | 1) Light and Color<br>2) Color Due to Refraction and Dispersion<br>3) The Production of Color by Reflection<br>4) Polarization and crystals<br>5) Color Due to Scattering and Diffraction<br>6) Color from Atoms and Ions<br>7) Color from Molecules<br>8) Color From Charge Transfer and Luminescence<br>9) Color in Metals, Semiconductors and Insulators<br>10) Fiber Optics and Data Transmission<br>11) Light-Sensitive Materials<br>12) Computer based methods of color match prediction and color match correction<br>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：<br>Method of Instruction | 講授 Lecture：80%<br>分組討論 Group discussion：10%<br>案例研討 Case study：0%<br>操做練習 Practical exercises：10%<br>講授 Lecture：% |
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| 教科書：<br>Textbooks | [1] Colour and Optical Properties of Materials, Richard J.D. Tilley, Second Edition, John Wiley & Sons (2011) |
| 參考書目：<br>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.<br>[2] Materials Science and Engineering: An Introduction , 10th ed., William D. Callister, JR and David G. Rethwisch, Wiley, 2018.<br>[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：<br>Notice | Finding a volunteer TA from within the course. |
| 評量方式：<br>Grading | 1) Assignment: 2 problem/quiz set (30%)<br>2) Midterm project review (30%)<br>3) Final-term project report: oral & paper (40%) |
| 備註說明：<br>Notes | None. |