Course Description

Color sciences and quality analysis techniques as they relate to the printing and allied industries. The application of theory to color reproduction, color control, print inspection, process control, and quality measurement. 3 lectures, 1 laboratory. Prerequisite: GRC 210.

Expected Outcomes

On completing the course the student will:

1. Have a good understanding of color phenomena as they occur in the printing industry.
2. Have a thorough understanding of print quality concepts and specifications.
3. Have developed color quality measurement, analysis, and judgment skills.

Texts:


Required Student Materials

Notebook; Textbook; Magnifier (10 power); Calculator with Statistical Functions

Expanded Course Outline

1. Introduction to Color Theory
   A brief history of color reproduction
   Principles of light and color
   Color reproduction theory
   Systems control theory
   Color management systems
2. The Perception of Color
   Light sources
   Color and appearance of surfaces
   Color vision processes
   Field of view considerations
3. Color Measurement
   Attributes of color
   Spectrophotometric measurements
   Colorimetric systems
   Color difference equations
   Densitometry-based color diagrams
   Visual color order systems
4. Raw Materials Control
   Substrate color and appearance properties
   Ink film color properties
   Evaluation methods and control strategies
5. Color Printing; Statistical Process Control
   - Image transfer characteristics
   - Printed image quality measurement
   - Printing quality optimization
   - Process control strategies

6. Printing Systems Analysis
   - Process capability
   - Feedback test images
   - System programming

7. Color Originals; Color Reproduction Quality Objectives
   - Characteristics of originals
   - Materials selection
   - Types of color reproduction
   - Tonal compression research
   - Saturation compression research

8. Additional Aspects of Print Quality
   - Image definition
   - Interference patterns
   - Surface characteristics
   - Quality tolerances

9. Color Separation Considerations
   - Image capture options
   - Scanner response and resolution
   - Image processing
   - Scanner programming strategies
   - Image structure and output recording

10. Color Communication
    - Color proof systems
    - Color communication methods
    - The color approval process

**Method of Instruction**

Lectures; Readings; Demonstrations; Laboratory Experiments; Print Quality Analysis Project.

**Method of Evaluation**

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
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<tr>
<td>Final Exam</td>
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<tr>
<td>Laboratory and Project Work</td>
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