

**Rochester Institute of Technology
Rochester, New York**

COLLEGE of SCIENCE
Center for Imaging Science

REVISED COURSE: 1050-703

- 1.0 **Title:** Color Appearance **Date:** Mar. 6, 2003
Credit Hours: 3
Prerequisite(s): 1050-701 Vision & Psychophysics
1050-702 Applied Colorimetry
Course proposed by: Mark D. Fairchild

2.0 **Course information:**

| | Contact hours | Maximum students/section |
|-----------------------|---------------|--------------------------|
| Classroom | 4 | 20 |
| Lab | | |
| Studio | | |
| Other (specify _____) | | |

Quarter(s) offered (check)

____ Fall ____ Winter X Spring ____ Summer

Students required to take this course:

M.S. Color Science Students

Students who might elect to take the course:

Graduate Students in Other Programs within the Center for Imaging Science

3.0 **Goals of the course:**

To provide a fundamental understanding of color appearance phenomena and modeling. To become introduced to and critically review primary literature in the field of color appearance. To develop critical thinking and oral presentation skills.

4.0 Course description

1050-703

Color Appearance

This course is designed for students with an understanding of the applications of colorimetry and presents the transition from the measurement of color matches and differences to the description and measurement of color appearance. This seminar course is based mainly on review and student-led discussion of primary references. Topics include: appearance terminology, appearance phenomena, viewing conditions, chromatic adaptation, and color appearance modeling. (Prerequisites: 1050-701)(1050-702) **Class 3, Credit 3 (S)**

5.0 Possible resources

5.1 Fairchild, M.D. *Color Appearance Models*; Addison Wesley: Reading, (1998).

5.2 Assigned journal and proceedings papers.

6.0 Topics (outline):

6.1 Introduction

6.1.1 General Overview

6.1.2 Basic and Advanced Colorimetry

6.2 Color Appearance Terminology

6.2.1 Definitions

6.2.2 Color Order Systems

6.3 Color Appearance Phenomena

6.3.1 Hunt Effect

6.3.2 Stevens Effect

6.3.3 Helson-Judd Effect

6.3.4 Bezhold-Brücke Effect

6.3.5 Bartleson-Breneman Studies

6.3.6 Others

6.4 Viewing Conditions

6.4.1 Illumination

6.4.2 Background

6.4.3 Surround

6.4.4 Mode of Viewing

6.5 Chromatic Adaptation

6.5.1 Phenomena

6.5.2 Physiology

6.5.3 Basic Modeling

6.5.4 Nonlinear Modeling

- 6.6 Color Appearance Modeling
 - 6.6.1 Structure of Color Appearance Models
 - 6.6.2 Historical Color Appearance Models
 - 6.6.3 CIE Models

- 6.7 Testing Color Appearance Models
 - 6.7.1 Scaling Experiments
 - 6.7.2 Magnitude Estimation Experiments
 - 6.7.3 Current Research

- 6.7 Research Directions
 - 6.8.1 Spatial Models
 - 6.8.2 Temporal Models
 - 6.8.3 Image Appearance Modeling
 - 6.8.4 Current Research

7.0 Intended learning outcomes and associated assessment methods of those outcomes

| Learning outcome | Oral Presentations | Homework/Project assignments |
|---|--------------------|------------------------------|
| 7.1 Concepts of Color Appearance Phenomena | X | X |
| 7.2 Structure and Implementation of Color Appearance Models | X | X |
| 7.3 Critical Review of Current and Historical Research Literature | X | X |

8.0 Program or general education goals supported by this course

8.1 Enable students to obtain an understanding of the basic concepts of color imaging systems. (COS/Imaging Science)

9.0 Other relevant information (such as special classroom, studio, or lab needs, special scheduling, media requirements, etc.)

9.1 This course is offered on-line.

10.0 Supplemental information - NONE