

# Color Science

Syllabus Number 0F111  
General Basic Subjects  
Elective 2 credit  
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## 1. Course Description

"Color science" is a learning to elucidate the color scientifically.

Color science is an academic discipline mainly to elucidate colors from aspects such as physics, physiology and psychology. There are research fields such as "color culture". In other words, it is cross-discipline from natural science to humanities. You will be able to master a wide range of knowledge about colors. Given two main themes of color science, those are

- 1) The mechanism people distinguish colors.
- 2) Strict representation of visible colors, and the way to communicate colors to others.

In this course, you will acquire knowledge on the fundamentals of color science such as "light and color", "color specification system" and "color harmony".

This course is designed to achieve Learning Goals 1,3, and 4 of the General Basic Subjects. It is mainly lecture type, and designed to group works and practices.

## 2. Course Objectives

The main purposes of this course are as follows:

- 1) The understanding of "light and color", and be able to explain its relationship.
- 2) To be able to understand and explain about two color specification systems.
- 3) The understanding of "color harmony", and able to make color combinations according to the theory.

## 3. Grading Policy

Practices, reports, etc. Submissions: 30%

Examination: 70%

Evaluate in total 100%

Answers and comments of the exam will be uploaded to LMS(Learning Management System) on the next day.

## 4. Textbook and Reference

Textbook

by Yoshio Ooi and Hideaki Kawasaki 『COLOR 色彩』

ISBN:978-4-901355-27-8 Nihon shikiken jigyou corp.

## 5. Requirements(Assignments)

Lectures will be done using PowerPoint, and materials are given out as needed.

An outline of the lectures will be able to see on LMS. After reconfirm the LMS and take part in this class.

Lectures will proceed by using "New color scheme card 199a" (¥780 + tax, Nihon shikiken jigyou corp). Besides that, sketchbook (172×250mm), paste, scissors, ruler and so on are necessary. Please bring them on the 2nd lecture.

## 6. Note

## 7. Schedule

- [1] Guidance, explanation of the course.  
Prep: Look up the "color" section in Shogakkan's "Japanese Language Dictionary" and inspect all its meanings.  
Review: Make a report to explain about "the function of color", and submit it in the next class.

- [2] Light and Color (1) What is light? The nature of light and color.  
 Prep: Examine about "electromagnetic wave" and "spectrum", and sum them up on your notebook  
 Review: Make a report to explain about "light", "spectral distribution" and "spectral reflectance curve", and submit it in the next class.
- [3] Light and Color (2) "eye mechanism" and "color mixture".  
 Prep: Read well p.4~5 of your textbook, and sum them up on your notebook.  
 Review: Make a report to explain about the connections between visual cell of retina and color, and submit it in the next class.
- [4] Color Specification System (1) Color classification.  
 Prep: Prepare about classification of colors, and sum them up on your notebook for group work.  
 Review: Make a report to explain about classification of colors, and submit it in the next class.
- [5] Color Specification System (2) Three attributes of color.  
 Prep: Examine color attributes, and sum them up on your notebook for group work.  
 Review: Make a report to explain about hue, lightness and saturation, and submit it in the next class.
- [6] Color Specification System (3) PCCS (Practical Color Co-ordinate System)  
 Prep: Examine the concept of "tone", and sum it up on your notebook.  
 Review: Make up the manual of PCCS, and submit it in the next class.
- [7] Color Harmony (1) Basic ideas of color scheme and color combination by hue difference.  
 Prep: Reconfirm the material "hue circle and tone" of PCCS, and memorize it.  
 Review: Make 7 examples of two-color combination by hue difference, and submit them in the next class.
- [8] Color Harmony (2) Color combination by tone difference.  
 Prep: Reconfirm the material "image of PCCS tone" and understand the concept.  
 Review: Make 6 examples of two-color combination by tone difference, and submit them in the next class.
- [9] Color Specification System (4) Color specification by word (idiomatic and systematic color names of JIS [Japanese Industrial Standard])  
 Prep: Examine color names (basic, peculiar, idiomatic and systematic color names), and sum it up on your notebook.  
 Review: Make a report to explain about the four color names, and submit it in the next class.
- [10] Color Harmony (3) Natural order and color harmony.  
 Prep: Read well p.48~49 on your textbook and summarize "natural sequence of hues" on your notebook.  
 Review: Make 5 examples of color scheme about "natural sequence of hues", and submit them in the next class.
- [11] Color Harmony (4) Many color harmonies and color harmony by Judd.  
 Prep: List one representative "color harmony theory" and examine its contents on your notebook.  
 Review: Make up Judd's four color harmony theories with color chips and attach a report in explanation (about 200 letters each), and submit them in the next class.
- [12] Color Harmony (5) Color harmony and color scheme technique.  
 Prep: Understand the outline of the material "color harmony and color scheme technique", and sum it up on your notebook.  
 Review: Make up 6 instructed color schemes of 2 to 4 colors combination, and submit them in the next class.

- [13] Universal Color.  
Prep: Examine the "universal design (UD)" and sum it up on your notebook.  
Review: Make a report to explain the relevance to "UD" and "a diversity of color vision", and submit it in the next class.
- [14] Color Specification System (5) Munsell color system.  
Prep: Examine about the "Munsell color system", and sum it up on your notebook.  
Review: Make a report to explain "Munsell color system", and submit it in the next class.
- [15] Summary  
Prep: Look over from 1 to 14 lectures again, and write down the points those you didn't understand.  
Review: summarize from 1 to 14 lectures.