Rochester Institute of Technology
Chester F. Carlson Center for Imaging Science

Imaging Systems Analysis: Tone Transfer Function
1051-451, Fall 2008

Instructor: Jonathan Arney <Arney@cis.rit.edu>
76-2104

Lectures: 76-1230, Tu. and Th. 8:00-9:20 am

Laboratory: 76-3125, Th, 6:00-7:50

Course Objective: This course is the study of how image information is transmitted through imaging systems of multiple imaging components. An example is a digital still camera, a computer, and a printer. You will learn how component devices are characterized experimentally and described quantitatively by mathematical modeling of both the forward and the inverse tone transfer functions (TTF). Common numerical indices of the TTF are introduces, including indices of sensitivity and contrast. Spectral, and temporal functions of sensitivity and contrast are examined. Systems with parallel channels of information, each with a characteristic TTF, are examined. Practical tools for controlling and calibrating system and component TTFs will be discussed.

Class material: Notes, Homework assignments, and my schedule are posted at the following address: http://www.cis.rit.edu/~jsapci/01Class1051-451.html

Grading: Homework will be reviewed in class, so late homework can not be accepted.

Homework 25%
Tests 25%
Lab. Reports 25%
Exam 25%

A = 90-100
B = 80-89
C = 70-79
D = 60-69

Schedule of Topics

1 September 2008

Week of	**Topics & Reading Assignments**	**Lab. Projects**
1 Sep	Mathcad Review, Appendix B Video_System.ppt JonesPlot.ppt	Equipment Check
8 Sep	02_Modeling the TTF	Lab 01: D50 Parametric Model
15 Sep	02_Modeling the TTF 03_Inverse-TTF-Linearize	Lab02: Linterp Inverse TTF
22 Sep	04_Jones Plot	
29 Sep	05_Flat-Fielding	Lab 03: Gamma & Log-TTF
6 Oct	06_Sensitometry & RLF	L04: Linearize D50 Camera
13 Oct	07_Spectral Sensitivity 08_Multi-Channel	L05: DC50 Flat Field
20 Oct	09_ Analytical Density	L06: Jones Plot RGB System Design: $D_{out} = D_{in}$
27 Oct	10-Halftones	L07: Analytical Densitometry
3 Nov	11-Dot Gain	L08: Halftone TTF
	Exam Week **Exam**	