SM3805: IMAGING SCIENCE STUDIO

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Imaging Science Studio

Subject Code
SM - School of Creative Media
Course Number
3805

Academic Unit
School of Creative Media (SM)

College/School
School of Creative Media (SM)

Course Duration
One Semester

Credit Units
6

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
This studio course explores a wide range of topics in imaging science, including (but not limited to) optics, image capturing (analog/digital photography, chronophotography, camera obscura, alternative photographic processes), color science,

visual phenomena, optical illusion, three-dimensional displays, image processing, computer vision, augmented and virtual reality (AR/VR), and connects the scientific concepts and techniques to artistic practice in the context of visual, media and experimental arts. It aims to equip students with the basic understanding of the theoretical (historical and scientific) knowledge as well as practical (technical) know-how in imaging science, and invite them to create an original artwork in which new artistic concepts or methods are developed.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Understand and articulate the basic concepts related to imaging science discussed in the course		x	x	
2	Reflect on the scientific concepts and techniques, and associate the knowledge with artistic practice		x	x	
3	Apply image capturing, generation, analysis and display techniques for creative purpose			x	x
4	Transform technical competence with imaging science methodologies into original artwork		x	x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Lectures about the history and theory of imaging science	1, 2	
2	Workshop	Hands-on workshops to introduce the methods and concepts of various topics in imaging science	2, 3, 4	
3	Oral presentation	Student presentations at various stages of project development	2, 3, 4	
4	Critique	Student critiques of existing work and peer projects	1, 2	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	In-class participation	1, 2	15	
2	Assignments	1, 2, 3, 4	30	
3	Presentations	1, 2, 3, 4	25	
4	Project	1, 2, 3, 4	30	

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

1. In-class participation

Criterion

This assessment task reviews students' participation and performance in discussions, debates and peer critique during the tutorial sessions. The evidence of 'negotiation', the sign of discovery, lies in students' pre-class preparation and interpersonal sensitivity to his/her peer members.

Excellent (A+, A, A-)

- Active in-class participation, positive listening, strong ability to stimulate class discussion and comment on other points.
- In-depth pre-class preparation and familiarity with peer reports and other materials.
- Interpret others' views with an open mind and ready to negotiate.
- Readiness to share personal insight via analysis and synthesis with informed views.
- Constructively critical, thus facilitating the discovery of new issues.

Good (B+, B, B-)

- Active in-class participation, positive listening, ability to initiate class discussion and comment on other points.
- Adequate pre-class preparation and familiarity with peer reports and other materials.
- Interpret opinions effectively.

Fair (C+, C, C-)

- Attentive in in-class participation, listening with comprehension, but only infrequently contributing.
- Adequate pre-class preparation but little familiarity with peer reports and other materials.
- Fair ability in interpreting opinions.

Marginal (D)

- Unmotivated to participate in class discussion or comment on other people's views.
- Little pre-class preparation and familiarity with peer reports and other materials.
- Poor ability in interpreting opinions.

Failure (F)

- Unwilling to participate in class discussion and comment on other points, even when requested by the teacher.
- No pre-class preparation and familiarity with peer reports and other materials.
- Minimal ability in interpreting opinions.

Assessment Task

2. Presentations

Criterion

This assessment will grade on content and fluency of presentation. Students should show their co-operation to conduct a well-organized presentation with their own argument and evidence from readings and notes. The threshold of ‘discovery’ lied in a student’ s self-initiatives to conduct additional research and to personalize theories for her/his personal daily experience.

Excellent (A+, A, A-)

- Rich, informative content, excellent grasp of the material with in-depth and extensive knowledge of the subject matter.
- Rigorous organization, coherent structure, and systematic exposition with a strong sense of narrative.
- Superior presentation skills: distinct pronunciation, fluent expression and appropriate diction, exact time-management.
- Critical analysis with insightful comments opening up new issues, or suggesting the ability to theorize.

Good (B+, B, B-)

- Adequate content with firm grasp of the material that informs the audience on a subject matter.
- Reasonable organization, balanced structure and composition.
- Good verbal communication: comprehensible pronunciation, fluent expression and diction, fair time-management.

Fair (C+, C, C-)

- Adequate content with comprehensive grasp of the material demonstrating basic knowledge of the subject matter.
- Fair organization, weak structure and composition.
- Fair presentation skills: acceptable pronunciation, expression and diction, fair time-management.

Marginal (D)

- Weak content, loose grasp of the general ideas with some knowledge of the subject matter.
- Poor organization, structure and composition.
- Poor presentation skills: marginal pronunciation, expression and diction, poor time-management.

Failure (F)

- Inadequate content, fail to identify the general ideas with knowledge of the subject matter.
- No organization, structure or/and composition.
- Poor presentation skills: marginal pronunciation, expression and diction, minimal time-management.

Assessment Task

3. Assignments and Project

Criterion

Students should demonstrate ability to utilize primary and secondary sources, execute creative ideas and projects.

Excellent (A+, A, A-)

- Work has strong affective quality and the articulation of personal styles and signature.
- Excellent appreciation, exploration and/or application of the aesthetic and expressive qualities of the medium.
- Work raises questions and instill insights about the process of conception, creative strategization and production.
- Innovative exploration by combining knowledge from different disciplines (e.g. mathematics, psychology, physics, anthropology, etc.) to create an inter-disciplinary project.
- Efficient adjustment of plans and strategies in response to resources (time, space, equipment, etc) available with constructive adjustment.

Good (B+, B, B-)

- Strong appreciation, exploration and/or application of the aesthetic and expressive qualities of the medium.
- Ability to create project/ work that demonstrate the processes of thinking and creative exploration.
- Proper adjustment of plans and strategies in response to resources (time, space, equipment, etc) available and constructive feedback/ suggestions.

Fair (C+, C, C-)

- Basic appreciation and/or application of the aesthetic and expressive qualities of the medium.
- Limited ability to create project/ work that demonstrate the processes of thinking and creative exploration.
- Adjustment of plans and strategies in response to resources (time, space, equipment, etc) available.

Marginal (D)

- Marginal appreciation of the aesthetic and expressive qualities of the medium.
- Marginal ability to create project/ work that demonstrate the processes of thinking and creative exploration.
- Limited adjustment of plans and strategies in response to resources (time, space, equipment, etc) available.

Failure (F)

- No appreciation of the aesthetics and expressive qualities of the medium.
- Fail to create project/ work that demonstrate the processes of thinking and creative exploration.
- Minimal adjustment of plans and strategies in response to resources (time, space, equipment, etc) available.

Additional Information for AR

All A+/A/A- grade assignment should comply with the highest performance of Discovery-oriented learning.

Part III Other Information

Keyword Syllabus

Optics – refraction, reflection, polarization, scattering, anamorphosis
Photography – pinhole camera, chronophotography, camera obscurs
Human visual system – visual perception, binocular vision, optical illusion, autostereogram, depth cues
Moving image – film and animation, zoetrope, flip book, strobe light, barrier grid
Three-dimensional displays – stereoscopy, multiview, light field, holography, autosterescopy
Image modification and analysis – filtering, image processing, computer vision
Computer-generated visual experience – augmented reality, virtual reality

Reading List

Compulsory Readings

	Title
1	Eugene Hech, Optics (5th edition), 2016.
2	Margaret Livingstone, Vision and Art: The Biology of Seeing (Updated and Expanded Edition), 2014.
3	Al Seckel, Masters of Deception: Escher, Dalí & the Artists of Optical Illusion, 2004.
4	Erkki Huhtamo, Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles, 2013.

Additional Readings

	Title
1	Christopher James, The Book of Alternative Photographic Processes (3rd edition), 2015.
2	Jason Geng, "Three-dimensional display technologies" in Advances in Optics and Photonics, 5(4), 456-535, 2013.
3	Richard Szeliski, Computer Vision: Algorithms and Applications, 2011.