CSST106 COURSE GUIDE

Course	CSST106 – Perception and Computer Vision
Sem/AY	First Semester/2024-2025

COURSE OBJECTIVES

At the end of the course, you should be able to

a. Explain and describe the fundamental concepts and techniques in computer vision, including image processing and feature extraction.
b. Utilize computer vision tools (e.g., OpenCV, TensorFlow, PyTorch) to implement and evaluate object detection, image segmentation, and motion analysis techniques.
c. Develop and present a comprehensive project that integrates various computer vision techniques to address a specific problem.
d. Collaborate effectively in teams to design, implement, and troubleshoot computer vision systems using Python and relevant libraries.
e. Critically evaluate the performance of computer vision algorithms and suggest improvements based on the application context.
f. Communicate findings and technical details of computer vision projects through well-structured reports and presentations.

COURSE CONTENT/OUTLINE

Module 1.0: Introduction to Computer Vision and Image Processing	**Topic 1.1:** Overview of Course and Setting up Python, OpenCV, TensorFlow, PyTorch. **Topic 1.2:** Image Processing Techniques
Module 2.0: Feature Extraction and Object Detection	**Topic 2.1:** Feature Extraction Methods **Topic 2.2:** Object Detection and Recognition
Module 3.0: Image Segmentation, Motion Analysis, and 3D Vision.	**Topic 3.1:** Image Segmentation and Motion Analysis **Topic 3.2:** 3D Vision and Depth Perception
Module 4.0: Integration, Applications, and Final Project Development.	**Topic 4.1:** Integration and Applications **Topic 4.2:** Final Project Development **Topic 4.3:** Course Review **Topic 4.4:** Final Project Presentations

COURSE MATERIALS/READINGS/RESOURCES

The main references of this course are the following:

a. Module 1-4

b. Digital Prints

c. Software Applications (Python, Google Collab)

COURSE CALENDAR/SCHEDULE

Week	Date/Period	Activity	Task
1-2	August 19, 2024 - August 30, 2024	**Course Orientation, Introduction to Computer Vision**	Participation in discussions, Quiz on course basics
3-5	September 2, 2024 - September 6, 2024	**Image Processing Techniques**	Implement image transformations and filtering, Submit processed images.
6	September 9, 2024 - September 13, 2024	**Feature Extraction Methods**	Mid-term project: Implementing object detection.
7-9	September 16, 2024 – October 4, 2024	**Object Detection and Recognition**	Mid-term project: Implementing object detection.
10	October 7, 2024 – October 11, 2024	**Midterm Examination**	
11-12	October 14, 2024 – October 25, 2024	**Image Segmentation and Motion Analysis**	Case study: Applying segmentation and motion tracking.
13-14	October 28, 2024 – November 8, 2024	**3D Vision and Depth Perception**	Creating depth maps and 3D reconstructions
15	November 11, 2024 – November 15, 2024	**Integration and Applications**	Group project: Developing a comprehensive vision system.
16	November 18, 2024 – November 22, 2024	**Final Project Development and Review**	Final project work sessions.
17	November 25, 2024 – November 29, 2024	**Final Project Presentations**	Presentation and defense of the final project
18	December 29, 2024 – January 3, 2025	**Final Examination**	

COURSE REQUIREMENTS

As LSPU students, you know that for the most part you will be studying on your own. **Do read/view the resources, guided by the Course Syllabus**. This way you will be able to keep up with the discussion, assignments and other requirements.

A. Participation in the Discussion

Software Engineering Ii is an online learning course. Class discussions will be online live streaming using Google Meet, Google Classroom for Learning Materials, Resource and Examinations and YouTube Channel Videos.

Please participate in the online discussions since this is an opportunity for you to clarify what you have learned on your own not only with your facilitator but also with other members of the class. It is also a good way to learn from one another. Depending on the size of the class, a tutor other than myself, may facilitate online discussions.

Your contribution to the discussion boards will be graded. Your postings should answer the discussion questions in a concise way and with as much insight and reflection as possible. There are usually no right or wrong answers to the questions, only honest and well thought out ones. And please be guided by the following marking scheme (middle values may be given).

RUBRICS FOR DISCUSSION POSTINGS				
Answer to Guide Question				**Score**
The answer shows a deep understanding of the ideas in the course materials.	5	7	10	
They reflect an incisive analysis of theory, practice and personal experience.	5	7	10	
They are well supported by valid arguments, appropriate examples/illustrations/details and relevant personal experiences.	5	7	10	
Reaction/Comments				
The reactions/comments reflect understanding and analysis of the DB postings concerned.	1	3	5	
They are reasonable and well supported by theory/practice/ personal experience/logical examples/illustrations.	1	3	5	
Timeliness				
The postings are timely/up-to-date (i.e., contributed within the assigned schedule/time frame).	1	3	5	
Organization and Mechanics				
The postings are organized, clear, concise, and grammatically correct.	1	3	5	
TOTAL				/50

B. Performance Tasks Accomplishment

This course requires performance tasks assigned in each of the modules. For Online Activities, you may refer to the assigned Google Classroom intended for this course. For Offline Activities, you can accomplish your tasks either saved in a flash drives or writing on the printed modules.

Submission Guidelines. Activity Sheets may be submitted online as email attachments in Google Classroom or with the designated email address of the Faculty-in-Charge.

Online submissions: Activity sheets submitted online as email attachments to the designated Google Classroom. This should carry this file name:

Examples: CSEL203_Week1_BernardinoM.doc

CSEL203_Week1_BernardinoM.pdf

C. Final Exam/Major Performance Task

There are only two major examinations in ITEP203 the Mid-Term and Final exam. This will cover the major concepts and principles of the course. **This exam is scheduled on the 9th and 18th week of the course, as per the LSPU Academic Calendar for AY 2020-2021. Please mark this early in your calendar so you free this date for the exam and can make necessary arrangements with your employer, if needed.** Examinations are given ONLINE, with the permission and scheduled given by your facilitator, using Google Classroom.

GRADING SCHEME

Following are the allotted points for each course requirement. The table shows the transmutation values for the final course grade.

Course Discussion	20%
Activity Sheets	40%
Exam/ Outputs	40%
TOTAL	**100 %**

HOUSE RULES

1. Participate on time and actively in each discussion date to maximize your learning.
2. Follow the Course Syllabus.
3. Submit activity sheets on or before their due dates. You will be duly informed and reminded about the deadline for each activity sheet. **Late activity sheets will be accepted, provided there is a valid reason for the delay. However, they cannot be awarded the highest possible score.**
4. Activity sheets should be written in English. Be grammatical. Write as effectively as possible (i.e., with clarity and coherence, organization, as well as conciseness).

5. Do your activity sheet assignments yourself and observe the ethics of scholarship. You may discuss your work with each other (for example during online study sessions or in a study group off schedule).

   If you "borrow" or use an idea from another source (meaning someone other than yourself), be sure to cite that source (or sources). Enclose quoted material in quotation marks or use italics and write the source. But as much as possible, paraphrase, do not lift. **Be reminded that as per LSPU policy, plagiarism can be grounds for suspension or expulsion**.

   Acknowledge sources and make a bibliography of them at the end of the assignment following APA (American Psychological Association) guidelines. You can consult http://owl.english.purdue.edu/owl/resource/560/01/ for the APA formats.

6. Always keep a duplicate copy of your activity sheets in your files just in case you need to resubmit them (e.g., they are lost in transit; or there is a technological glitch).

7. **SMS and phone calls should be kept to a minimum, should be sent/made only when necessary, and only between 9am and 7pm, Monday to Saturday.**

CONTACT INFORMATION

I am your Faculty-in-Charge. There is more information about me in our course website in LMS. You may reach me at:

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