

## TIF21-22-45

### Graphical Visualization Engineering

#### Teknik Visualisasi Grafis

#### BASIC INFORMATION

<b>Course Credit</b>	3 / 150 minutes per Week
<b>Course Type</b>	Required
<b>Course Classification</b>	Engineering Topics
<b>Prerequisites</b>	Enter Prerequisite

#### STUDENT AND LEARNING OUTCOMES

##### Covered Student Outcomes

Fundamental and Engineering Knowledge (a)	Engineering Design (c)
Development of Engineering Solution (b)	Modern Tools Utilization (e)

##### Learning Outcomes

- LO1** Students are able to design and visualize 2-D graphical objects.
- LO2** Students are able to design and visualize 3-D graphical objects.
- LO3** Students are able to use OpenGL as one of the tools for designing 2-D and 3-D graphical objects.
- LO4** Students are able to use tools for designing the lighting process of an object in creating a realistic visualization of 3-D objects.

#### COURSE DESCRIPTION

This course learn the basic concepts of graphical math and its relation in designing realistic graphical objects by considering lighting and shadow models.

#### TOPICS

1. Basic mathematical graphics
2. 2-Dimensional graphics transformation

3. 3-Dimensional graphical transformation
4. Graphics Programming with OpenGL
5. Viewing and 3-Dimensional Projection
6. Lighting and Shading
7. Ray-Tracing Concept

## REFERENCES

- [1] Govil-Pai, Shalini, *Principles of Computer Graphics: Theory and Practice Using OpenGL and Maya*, Springer Science+Business Media, Inc., 2004.
- [2] Edward Angel, David Shreiner, *Interactive Computer Graphics: A Top-down Approach With Shader-Based OpenGL*, Pearson Education, Inc., publishing as Addison-Wesley, 2012.
- [3] Hill, F.S, Jr., Stephen M. Kelley Jr, *Computer Graphics Using OpenGL*, Pearson Education Inc., 2007.
- [4] Shreiner Dave , *OpenGL Programming Guide*, Addison-Wesley, Pearson Education Inc., 2010.

