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EUROPEAN UNIVERSITY FOR CUSTOMISED EDUCATION

STUDY GUIDE

INTRODUCTION TO PHOTOGRAMMETRY 2026-2027 S1

Organised by

Université Polytechnique Hauts-de-France

Brandenburg University of Technology Cottbus - Senftenberg · Universidad de Cantabria · Università di Catania · Université Polytechnique Hauts-de-France · UMONS University of Mons · University of the Peloponnese · Vaasan yliopisto University of Vaasa · Politécnico de Viseu

1. IDENTIFYING DATA.	
· Course Name.	Introduction to photogrammetry 2026-2027 S1
· Coordinating University.	Université Polytechnique Hauts-de-France
· Partner Universities Involved.	None
· Course Field(s).	3D, reality capture, digital creation
· Related Study Programme.	Architecture, Geography, Game, Digital creation, Cultural heritage, Archaeology
· ISCED Code.	6 & 7
· SDG.	4 & 9
· Study Level.	Bachelor (second or third year) or Master
· EUNICE Key Competencies	• Green – strongly • Orange - moderately • Red – partially • Blank cell - not at all

Problem solving	
Teamworking	
Communication	
Self-management	
Cognitive flexibility	
Digital competence	
Technical competence	
Global intercultural competence	

· Number of ECTS credits allocated.	2
· Mode of Delivery.	Online live
· Language of Instruction.	English
· Course Dates.	1st half – 1st October / 30th november
· Precise Schedule of the Lectures.	Once a week, 3h course
· Key Words.	3D, reality capture, photogrammetry, photography
· Catchy Phrase.	Learn how to digitize the world !

· Prerequisites and co-requisites.	- Basic 3D skills - Basic photography skils - available for B or M - Average English level required
· Number of EUNICE students that can attend the Course.	Max 30
Number of EUNICE students that can attend the course per institution	3
· Course inscription procedure(s).	Registration via the Eunice website

2. CONTACT DETAILS.	
· Department.	ISH
· Name of Lecturer.	Nicolas Lissarrague
· E-mail.	Nicolas.lissarrague@uphf.fr
· Other Lecturers.	

3. COURSE CONTENT.

This introductory course in photogrammetry will enable you to understand the significance, advantages, and limitations of photogrammetry.
It will provide you with the fundamental principles of photographic technique, allowing you to analyze the challenges posed by an object to be digitized and to determine the most appropriate image-capture strategy.
The course will then teach you how to optimize photographs using Darktable and RawTherapee in order to improve the subsequent processing stages and enhance the quality of the final 3D reconstruction.

Finally, it will enable you to master the different stages of photogrammetric reconstruction using RealityScan, including the computation of the point cloud, depth maps, mesh generation, and texture mapping.
Through the skills acquired during this course, you will be able to digitize objects efficiently and accurately using photogrammetry.

4. LEARNING OUTCOMES.

[Provide a list of the expected learning outcomes for this course, including skills and competencies acquisition and knowledge acquired in the course]

- Basic knowledge of photogrammetry history
- Understanding of the photogrammetry workflow, from shooting to final result
- Understanding of camera settings and photographic equipment (tripod, filter, turntable, etc.)
- Knowing how to choose and implement an image acquisition strategy and how to manage accurate image covering
- Knowing how to optimize photos for photogrammetry processing with Dark Table and Rawtherapee
- Learn how to use RealityScan, manage its interface and the multiple stages of photogrammetric reconstruction.
- Learn how to export the final 3D model for different purposes (3D printing, high definition, low definiton, etc.)

5. OBJECTIVES.

Be able to carry out a photogrammetric digitization : know how to optimize camera settings, implement an appropriate image acquisition strategy, optimize photographs for photogrammetric processing, and configure the different stages of the photogrammetric reconstruction workflow.

6. COURSE ORGANISATION.

UNITS	
1.	A brief history of photogrammetry
2.	Theory and practice of photographic technique (control of lighting and different types of blur)
3.	Theory and practice of shooting strategy
4.	Post processing photos for optimizing photogrammetric reconstruction
5.	Processing photos In RealityScan for point cloud generation ; optimization of the point cloud

6.	Processing the mesh and the texture ; exporting the final result

LEARNING RESOURCES AND TOOLS.

Online course support, Rawtherapee, Dark Table and Realityscan softwares (all free)

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.

Lecture, step by step tutorial.

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

Individual project (photogrammetry of an object) that should be sent two weeks after the last course and will receive **a graded** assessment. Criteria is mainly based on the quality of the final 3D reconstruction : precision and optimization of the mesh, texture quality

OBSERVATIONS.

During the course, students must have access to :

- a camera (smartphone camera is accepted),
- a computer with at least 5Go of free space, a recent nvidia graphic card (3-4 years old max)
- Dark table, Rawtherapee and RealityScan softwares (all are free)

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

- 3D Recording and modelling in archaeology and cultural heritage, Fabio Remondino & Stefano Campana ; BAR international Series, 2014, ISBN 9781407312309
- Mobilizing the past for a digital future, Erin Walcek Averett, Jody Michael Gordon & Derek B. Counts ; The Digital Press, 2016, ISBN 978062790137
- Photogrammetry in paleontology – a practical guide, Heinrich Mallison & Oliver Wings ; Journal of paleontological techniques, n°12, 2014, ISSN 16465806
- Strategies and experiments for massive 3D digitalization of the remains after Notre-Dame de Paris' fire, Florent Comte, Anthony Pamart, Kévin Réby, Livio de Luca ; International Archives of the photogrammetry, remote sensing and spatial information sciences, XLVIII-2, 2024
- Star Wars: Battlefront and the Art of Photogrammetry, Kenteh Brown & Andrew Hamilton ; Games Developpers Conference 2016 : https://www.youtube.com/watch?v=U_WaqCBp9zo
- Scanning the Seven Wonders: Using Photogrammetry To Craft Stories, Matthias McCoy-Thompson ; Unreal Fest 2022 : https://www.youtube.com/watch?v=ZwVC6GDXUfQ