Nr. 13089 24.05.2024

Universitatea Politehnica Timișoara

HOTĂRÂRE
a Consiliului de Administrație al Universității Politehnica Timișoara
Nr. 101 / 22.05.2024
- privind aprobarea desfășurării cursului "3D Modelling for Civil Engineering Works" –

Având în vedere solicitarea Facultății de Construcții pentru desfășurarea cursului intensiv de tip Blended Intensive Program "3D Modelling for Civil Engineering Works", Consiliul de Administrație emite prezenta

HOTĂRÂRE

Art.1. Se aprobă desfășurarea cursului intensiv de tip Blended Intensive Program "3D Modelling for Civil Engineering Works", derulat sub egida programului Erasmus+, conceput, structurat și predat conform anexei de către prof.univ.dr.ing. Ioan-Sorin Herban, conf.univ.dr.ing. Simon-Alexandru Pescari, conf.univ.dr.ing. Clara Beatrice Vâlceanu și s.l.dr.ing. Nicolae Andrei Crișan.

Art.2. Prezenta hotărâre se comunică Biroului Consiliului de Administrație, Direcției Resurse Umane, Departamentului de Relații Internaționale și Facultății de Construcții.

RECTOR,
conf.univ.dr.ing. Florin DRĂGAN

SECRETAR ŞEF UNIVERSITATE,
ing. Iolanda Dorina COSOVAN

SOLICITARE

Către, Consiliul de Administrație al UPT

în atenția Domnului Rector, Conf. Dr. Ing. Florin Drăgan

Subsemnatul **Raul Zaharia**, decan al **Facultății de Construcții** vă rog să aprobați desfășurarea cursului intensiv tip Blended Intensive Program „**3D MODELLING FOR CIVIL ENGINEERING WORKS**" și acordarea a **3 credite (ECTS)** studenților participanți.

Cursul (parte teoretică și aplicativă) se va desfășura astfel:

-în format online (zoom): 1 iulie – 15 iulie 2024;

-în format față în față: 19 iulie – 31 iulie 2024.

Cursul (proiectul) se derulează sub egida programului **Erasmus+** sub forma unui **Blended Intensive Programme**.

Atașăm la prezenta solicitare:

- Fișa disciplinei;
- Posterul de prezentare.

Cu mulțumiri,

Timişoara
17.05.2024

Decan
Prof. Dr. Ing. Raul Zaharia

SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2]/ Department [3]	Civil Engineering / Overland Communication Ways, Foundations and Cadastral Survey
1.3 Chair	—
1.4 Field of study (name/code[4])	Civil Engineering / Earth Science/ 30
1.5 Study cycle	Bachelor, Master, Ph.D
1.6 Study program (name/code/qualification)	3D Models / TLS / UAS / BIM / 10 / Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[5]	3D MODELLING FOR CIVIL ENGINEERING WORKS						
2.2 Coordinator (holder) of course activities	Prof. Sorin HERBAN; Lecturer Andrei CRISAN, Assoc Prof. Simon PESCARI, Assoc Prof Beatrice VALCEANU						
2.3 Coordinator (holder) of applied activities[6]	Associate Prof. Beatrice VILCEANU; Lecturer Andrei CRISAN						
2.4 Year of study[7]	-	2.5 Semester	-	2.6 Type of evaluation	E	2.7 Type of discipline[8]	Df

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [9]

3.1 Number of fully assisted hours / week	3 of which:	3.2 course	2	3.3 seminar / laboratory / project	1
3.1* Total number of fully assisted hours / semester	42 of which:	3.2* course	28	3.3* seminar / laboratory / project	14
3.4 Number of hours partially assisted / week	of which:	3.5 training		3.6 hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	3.5* training		3.6* hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	2 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0,5
		hours of individual study after manual, course support, bibliography and notes			0,5
		training seminars / laboratories, homework and papers, portfolios and essays			1
3.7* Number of hours of unassisted activities / semester	33 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			9.5
		hours of individual study after manual, course support, bibliography and notes			9.5
		training seminars / laboratories, homework and papers, portfolios and essays			14
3.8 Total hours / week [10]	5				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

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[1] The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.
[2] The name of the faculty which manages the educational curriculum to which the discipline belongs
[3] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[4] The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.
[5] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[6] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[7] Year of studies in which the discipline is provided in the curriculum.
[8] Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).
[9] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≤ 28 hours / wk and (3.8) ≤ 40 hours / wk.
[10] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4. **Prerequisites** (where applicable)

4.1 Curriculum	• -
4.2 Competencies	• -

5. **Conditions** (where applicable)

5.1 of the course	• Medium lecture room. Support devices: laptop, projector, whiteboard.
5.2 to conduct practical activities	• Geodetic and topographic laboratories, specific surveying equipment.

6. **Specific competencies** acquired through this discipline

Specific competencies	• Using 3D model software
Professional competencies ascribed to the specific competencies	• Solving complex problems in inter-disciplinary co-operation. • Using 3D Equipment and software. • Team working.
Transversal competencies ascribed to the specific competencies	• Completing activities, work in team, promoting dialogue, cooperation, positive attitudes, promoting diversity, multiculturalism and self-improvement. • Correct self-evaluation for continuous professional improvement.

7. **Objectives of the discipline** (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Knowledge in the fields of 3D Modelling and BIM. • The course rounds off the scheduling of the students in basic knowledge regarding close-range photogrammetry, TLS (Terrestrial Laser Scanning), UAS (Unmanned Aerial System), BIM (Building Information Modeling).
7.2 Specific objectives	• Using 3D Equipment and software. • Recognizing the difference in point clouds created by different techniques. • Integrate the models in BIM.

8. **Content**[11]

8.1 Course	Number of hours	Teaching methods[12]
1. Introduction to close-range photogrammetry, TLS, UAS and BIM	2	Lecture, explanations, conversation.
2 Overview of BIM, UAS and Laser Scan	2	
3. Data acquisition by close-range photogrammetry	2	

[11] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage) The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".
[12] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

4. Data acquisition by Laser Scanning technology	2	
5. Data acquisition by UAS	8	
6. Data processing and modeling	10	
7. Case studies	1	
8. Applicability to construction management and construction sustainability	1	

Bibliography [13]

1. Strelnikova D, Ioneanu S, Herban S, Paulus G, MAnfreda S – *Operations Manual for the Use of UAS in Environmental Studies (based on SORA 2.0)*, https://zenodo.org/records/7562377, May 2022.
2. Vîlceanu C.-B. – *Geodata for 3D modeling. Current and future practice*, ISBN 978-606-35-0329-0, Politehnica Publishing House, Timisoara, 2022.
3. Hardin B, McCool D – *BIM and Construction Management, Proven Tools, methods and workflows*, Second Edition, Wiley Publishing House, ISBN: 978-1-11 8-94276-5, 2015.

8.2 Applied activities [14]	Number of hours	Teaching methods
1. Project Work 1 – Using close-range photogrammetry for 3D modelling of a 3D modelling of a cultural heritage object in Timisoara	2	Field and Laboratory work presentation, questions. Field work for using close-range photogrammetry, laser scanning (TLS) and UAS technologies in order to collect data. Processing of the collected data in order to create the 3D models of the objectives. Integrating the realized models in BIM platform Evaluation of the results
2. Project Work 2 – Using TLS for 3D modelling of a cultural heritage object in Timisoara	4	
3. Project Work 3 – Using UAS for 3D modelling of in western part of Romania	4	
4. Project Work 4 – Integrate the models in BIM	4	

Bibliography [15]

1) Vîlceanu C.-B., Herban I.S., Dungan L.I. – *3D printing and scanning*, Eurobit Publishing house, Timisoara, 2020, ISBN 978-973-132-627-6.
2) Vîlceanu C.-B., Herban I.S., Chendeș R. V. - Applications of advanced measurement technologies in geodesy, ISBN 978-606-35-0566-9, Politehnica Publishing House, Timisoara, 2023.

[13] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[14] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as "Seminar:", "Laboratory", "Project:" and / or "Practice/training".
[15] At least one title must belong to the discipline team.

9. **Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program**

- The students will have good knowledge regarding the technology and software for 3D modeling of different objects with applicability to civil engineering works.
- Abilities for 3D modeling are highly appreciated by the employers.

10. Evaluation

Type of activity	10.1 Evaluation criteria [16]	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Correct presentation and correct answers at Commission requests	Project Presentation within assigned team	34%
10.5 Applied activities	S:		
	L: Correct presentation and correct answers at Commission requests	Project Presentation within assigned team	66%
	P[17]:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [18])			
• The minimum performance standard for Course is mark five. • The minimum performance standard for Practical activity is mark five.			

Date of completion

May 16, 2024

Course coordinator
(signature)

.....

Coordinator of applied activities
(signature)

.....

Head of Department
(signature)

.....

Date of approval in the Faculty Council [19]

16.05.2024

Dean
(signature)

.....

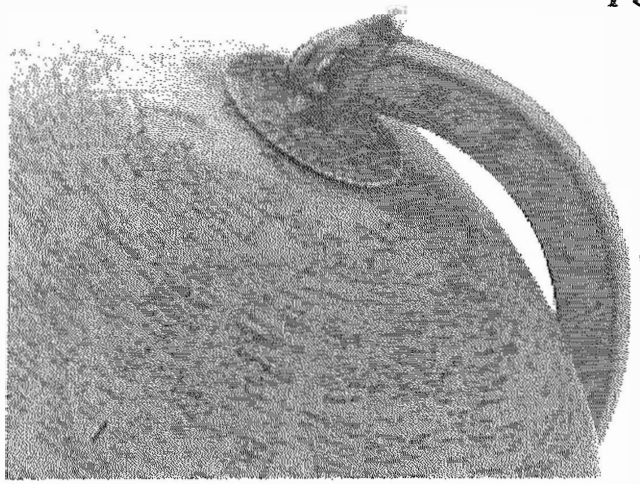
[16] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

[17] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline

[18] It will not explain how the promotion mark is awarded

[19] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.

POLITEHNICA UNIVERSITY TIMIŞOARA
CIVIL ENGINEERING FACULTY



Blended Intensive Programme

3D MODELLING FOR CIVIL ENGINEERING WORKS

2024

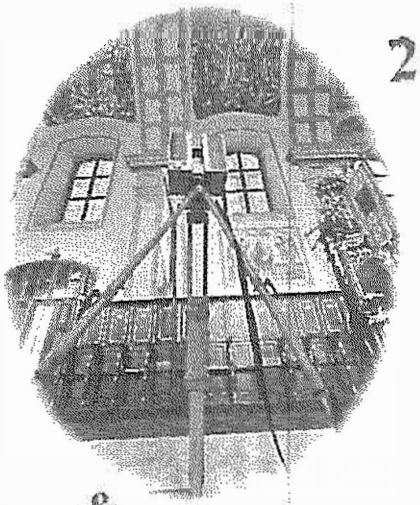
Erasmus+

Open to all registered students
Students can apply for Erasmus+ funding at their home university

Università degli Studi "G. d'Annunzio"
Chieti - Pescara

Politecnico di Bari

ÓBUDAI EGYETEM
ÓBUDA UNIVERSITY



On-line Lectures (zoom) || 1-15 July 2024
Main topics cover data acquisition & processing using close-range photogrammetry, TLS, UAS and BIM

Live in Timişoara || 19-31 July 2024
Lectures & Practice sessions
Thematic visits to private companies

Upon completion students will receive Certificate & 3 ECTS