

SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Civil Engineering
1.3	Department	Structural Mechanics
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Civil Engineering (english) / Civil Engineer
1.7	Form of education	Full time
1.8	Subject code	15.00

2. Data about the subject

2.1	Subject name			Computer Programming and Programming Languages					
2.2	Subject area			Civil Engineering					
2.3	Course responsible/lecturer								
2.4	Teachers in charge of seminars			Assoc.Prof. F.-Zsongor GOBESZ - go@mecon.utcluj.ro					
2.5	Year of study	1	2.6 Semester	2	2.7 Assessment	C	2.8 Subject category	DF DI	

3. Estimated total time

3.1	Number of hours per week	2	3.2	of which, course:	0	3.3	applications:	2
3.4	Total hours in the curriculum	28	3.5	of which, course:	0	3.6	applications:	28
Individual study								hours
Manual, lecture material and notes, bibliography								28
Supplementary study in the library, online and in the field								8
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								10
Tutoring								–
Exams and tests								1
Other activities								–
3.7	Total hours of individual study	47						
3.8	Total hours per semester	75						
3.9	Number of credit points	3						

4. Pre-requisites (where appropriate)

4.1	Curriculum	none
4.2	Competence	none

5. Requirements (where appropriate)

5.1	For the course	–
5.2	For the applications	Labroom with PCs, videoprojector and screen.

6. Specific competences

Professional competences	<p>After completing the syllabus, the students will be able to:</p> <ul style="list-style-type: none"> - describe an algorithm through logical scheme (by procedural reasoning); - develop or modify Fortran console applications using development toolkits (with or without input/output files, including subroutines, functions); - use the Force2 PE and the G95 Fortran compiler; - use mathematical libraries for engineering calculus.
Cross competences	<p>Knowledge and experience of employing efficient and responsible work strategies, punctuality, seriousness and liability based on the principles, norms and values of professional ethics.</p> <p>Applying efficient technics in team work.</p> <p>Improving logical thinking and reasoning.</p> <p>Professional and personal development through continuous training and active adaptation to new technical specifications.</p>

7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	To develop skills in applied informatics and to improve deterministic way of thinking by procedural approaches.
7.2	Specific objectives	Assimilation of theoretical and practical knowledge about the use of computers and the development of Fortran applications.

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
8.2. Applications/Seminars	Teaching methods	Notes
Presentation of the laboratory and of the equipment, health and safety issues, rules of conduct, organizational aspects. How to use the equipment and peripherals, available resources. Flowcharts / logical schemes, aspects related to structuring and generalization.	Presentation, examples and solutions with discussion, stimulating interactivity, individual subjects (home works)	Each student has to work on a PC, the activity and the solved topics will be checked and assessed weekly
Exercises with logical schemes/ flowcharts.		
Entity types and type specifications. Translation of numerical and logical expressions in Fortran, priority of the operators, exercises. Input/output and control statements.		
Loop choices. Arrays and position indices. Exercises with vector arrays and strings: extreme values and sorting methods.		
Transcribing flowcharts in Fortran, exercises with matrix.		
The GUI of Force2 PE. Creating a Fortran console application from a previous flowchart. Compiler options, handling compiling and link-editing errors and warnings, trace and debug. Using logical units (OPEN, CLOSE). The format specification with descriptors.		
Exercises with matrices (using files).		
Dynamic memory allocation. Exercises with vector and matrix arrays (using input and output data files).		
Program units, examples. Calculation of mathematical formulas using subroutines and intrinsic functions.		
Exercises with user-defined subroutines and functions. Entry points and return variants, recursive functions.		
Select Case structure, criteria. Calculation of geometric features of		

some figures, with repeat options. Exercises with arrays using user-defined subroutines and functions, with dynamic memory allocation, using also format descriptors.		
Continued exercises with arrays using user-defined subroutines and functions, respectively format descriptors, in combination with selection structures.		
Use of pointers (input / output string handling).		
<i>Assessment – Practical Test.</i> Portfolio rating and discussion of the work done during the semester.		
Bibliography <ol style="list-style-type: none"> 1. Class notes and hand-outs. 2. Lepsch, G.: Force Fortan – <i>The Force Project</i> (http://force.lepsch.com/) 3. http://users.utcluj.ro/~go/ (samples and further resources) 		

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Acquired skills will be needed by engineers working in building design and/or research (also in education).

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	–	–	–
10.5 Applications	Activity and portfolio	Assessment of each labwork and grading of individual assignments	40%
	Application of knowledge	Practical test on computer – creating a console application in order to solve a problem	60%
10.6 Minimum standard of performance			
Handing in homeworks by the deadlines and obtaining at least 4.5 points individually for each of the two separate evaluation criteria. The final grade is rounded to the nearest whole number. In order to obtain the credits the final grade must be at least 5 (five).			

Date of filling in:		Title Surname Name	Signature
19.06.2025	Responsible	Assoc.prof. F.-Zsongor GOBESZ	
	Teachers in charge of application	Assoc.prof. F.-Zsongor GOBESZ	

Date of approval in the department of Structural Mechanics

19.06.2025

Head of department

Assoc.Prof. Anca G. POPA

Date of approval in the Faculty of Civil Engineering

25.06.2025

Dean

Prof. Daniela L. MANEA