MINISTERUL EDUCAŢIEI
UNIVERSITATEA „AUREL VLAICU" DIN ARAD
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Operator de date cu caracter personal nr.2929

SYLLABUS

1. Study programme

1.1. Higher education institution	**„Aurel Vlaicu" University of Arad**
1.2. Faculty	**of Exact Sciences**
1.3. Department	**Department of Mathematics and Computer Science**
1.4. Field of study	**Informatics**
1.5. Study level	**2024-2025**
1.6. Ciclul de studii	**Bachelor**
1.7. Study programme / Qualification	**Computer Science**
1.8. Form of education	**Full – Time study**

2. Course details

2.1. Name of the course	**GlAF1O04 Fundamentals of programming**
2.2. Course coordinator	**dr. Bejan Crina-Anina**
2.3. Seminar/laboratory/project coordinator	**drd. Lupuți Antonio-Marius-Flavius**
2.4. Study year	**1**
2.5. Semester	**1**
2.6. Evaluation type	**ES**
2.7. Course type	**Ob**

3. Estimated total time (hours per semester)

3.1. Hours per week	**4**
3.2. Lecture hours per week	**2**
3.3. Seminar/laboratory/project hours per week	**2**
3.4. Total hours per curriculum	**56**
3.5. Lecture hours per semester	**28**
3.6. Seminar/laboratory/project hours per semester	**28**
	Time division [hrs]
3.4.1. Independent study from textbooks, course support, bibliography and notes	**40**
3.4.2. Additional reading (libraries, specialized electronic platforms and field research)	**32**
3.4.3. Preparing of seminars/laboratories/projects, homework, papers, portfolios and essays	**18**
3.4.4. Tutorial coaching	**0**
3.4.5. Examinations	**4**
3.4.6. Other activities	**0**
3.7. Total individual study hours	**94**
3.8. Total hours per semester	**150**
3.9. Number of ECTS credits	**6**

4. Prerequisites (if applicable)

4.1. Curriculum related	
4.2. Competence related	

5. Conditions (if applicable)

5.1. for the lecture	**Lecture room, equipped with laptop, video projector and appropriate software.**
5.2. for the seminar	
5.3. for the laboratory	**Laboratory room, properly equipped: computers, network, Internet connection, appropriate software.**
5.4. for the project	

6. Specific educational objectives (competences to be acquired)

6.1. Competenţe profesionale	**C1.Programming in high level programming languages;** **C2.Development and maintenance of computer applications;** **C4.Using the theoretical bases of computers and formal models;**
6.2. Competenţe transversale	**CT1.Applying the rules of organized and efficient work, of responsible attitudes towards teaching-scientific field, to value the own creative potential, while respecting the principles and norms of professional ethics.** **CT2.Efficient conduct of the activities organized in an inter-disciplynary group and developing the personal communication skills, networking and collaboration with various groups;** **CT3.Using of efficient methods and techniques for learning, informing, research and development of the capacity to value knowledge, adapting to the requirements of a dynamic society and communicating in English and in an Internationally widespread language.**

7. Course outcomes (resulting from the specific educational objectives to be acquired)

7.1. General outcomes	**Students learn the concepts of procedural programming problems and algorithm design and analysis.** **To develop students' ability to apply correctly the knowledge acquired and to develop their analytical skills.**
7.2. Specific outcomes	**Students will be able to:** **- Identify the appropriate algorithm for a given problem;** **- Design, implement and optimize an algorithm as a solution to a given problem;** **- Perform complexity calculations for a given algorithm.**

8. Outline (if applicable)

8.1 Lecture Outline	Teaching methods	Remarks
Introduction to structured and procedural programming	interactive exposition, heuristic conversation, exemplification	2 hrs
Data types. Variables	interactive exposition, heuristic conversation, exemplification	2 hrs
I/O functions	interactive exposition, heuristic conversation, exemplification	2 hrs
Operators. Expressions	interactive exposition, heuristic conversation, exemplification	2 hrs
Instructions: decision, multiple choice, repetitive, control, jump, callback	interactive exposition, heuristic conversation, exemplification	8 hrs
Arrays	interactive exposition, heuristic conversation, exemplification	8 hrs
Functions. Recursivity	interactive exposition, heuristic conversation, exemplification	4 hrs

8.2 Lecture References
1. T. Cormen, C. Leiserson, R. Rivest, and C. Stein. Introduction to Algorithms. 2nd ed. Cambridge, MA: MIT Press, 2001. ISBN:9780262032933 2. **2. D. Knuth, Arta Programarii Calculatoarelor, Vol.1: Algoritmi Fundamentali, Teora, 2000** **3. M. Sipser, Introduction to the Theory of Computation. 2nd ed. Boston, MA: Course Technology, 2005. ISBN: 9780534950972.** **4. K.Jamsa, L. Klander, Totul despre C şi C++, Manual fundamental de programare în C şi C++, Ed. Teora, 2004** **5. V. Iordan, Algoritmi si programare in C, Ed.Eurostampa, 2007** **6. Siddhartha Rao, C++ in One Hour a Day, Sams Teach Yourself, Pearson Education (US), 2016** **7. Subrata Saha, Subhodip Mukherjee, Basic Computation and Programming with C, Cambridge University Press, 2017**

8.3 Seminar Outline	Teaching methods	Remarks

8.4 Seminar References		

8.5 Laboratory Outline	Teaching methods	Remarks
Introduction to the working environment. Compilation	debate, problem-solving, exercise, application	2 hrs
Operators. Applications with expressions	debate, problem-solving, exercise, application	2 hrs
Applications for decision and conditional statement	debate, problem-solving, exercise, application	4 hrs
Applications for repetitive statement	debate, problem-solving, exercise, application	8 hrs
Applications for arrays	debate, problem-solving, exercise, application	6 hrs
Applications for functions. Recursivity	debate, problem-solving, exercise, application	6 hrs

8.6 Laboratory References

1. T. Cormen, C. Leiserson, R. Rivest, and C. Stein. Introduction to Algorithms. 2nd ed. Cambridge, MA: MIT Press, 2001. ISBN:9780262032933 2.
2. D. Knuth, Arta Programarii Calculatoarelor, Vol.1: Algoritmi Fundamentali, Teora, 2000
3. M. Sipser, Introduction to the Theory of Computation. 2nd ed. Boston, MA: Course Technology, 2005. ISBN: 9780534950972.
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8.7 Project Outline	Teaching methods	Remarks
8.8 Project Outline		

9. Correlation of course outline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

The content of the subject is in line with the content of similar subjects in other universities in the country and abroad. In order to better adapt the content of the subject to the requirements of the labour market, meetings were held with employers - representatives of the business environment and with mathematics and computer science teachers from the preuniversity education in Arad.

10. Evaluation / Grading (if applicable)

Activity type	Evaluation criteria	Evaluation methods	Percentage of the final grade
10.1. Lecture	Accuracy and completeness of knowledge. Logical consistency. Degree of assimilation of specialist language.	Oral assessment (final in the exam session): -Presentation of a final project - Free student presentation - Evaluation conversation - Oral questionnaire.	50%
10.2. Seminar			
10.3. Laboratory	Ability to operate with assimilated knowledge. Ability to apply in practice.	Oral assessment (final in the examination session): -Completion and presentation of the final project	30%
10.4. Project	Homeworks.	Oral evaluation.	20%

10.5 Minimal performance standard

Learning fundamental concepts, using specialist language, making a simple application.

Course coordinator	Seminar/laboratory/project coordinator	Head of the Department	Dean
Conf. univ. dr. Crina Anina Bejan	drd. Lupuți Antonio - Marius - Flavius	Lector Popa Lorena	Prof.univ.dr. Sorin Florin Nădăban