

COURSE DESCRIPTION

1. Program details

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|---------------------|---------------------------------------------------------------------------|
| University | "Lucian Blaga" University of Sibiu |
| Faculty | Engineering Faculty |
| Department | Department of Computer Science and Electrical and Electronics Engineering |
| Main field of study | Computer Engineering and Information Technology |
| Level of education | Master |
| Specialization | ADVANCED COMPUTING SYSTEMS |

2. Course details

| | | | | |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------------|
| Course title | Advances in Software Engineering | | | |
| Course code | Type of course | Year of study | Semester | Number of credits |
| mACS.102.SO | compulsory | 1 | 1 | 7 |
| Evaluation type | Type of course (FD=fundamental discipline.; DD=domain discipline; SD=specialized discipline; CD=complementary discipline) | | | |
| E | DD | | | |
| Course instructor | Dr. Ing. SIMA Nicolae Dorin | | | |
| Seminar/lab/project instructor | Dr. Ing. SIMA Nicolae Dorin | | | |

3. Estimated time

| | | | | |
|---------------------------------------------------------------|---------|-----|---------|------------------------|
| Course duration in the curriculum – number of hours per week | | | | |
| Lecture | Seminar | Lab | Project | Total |
| 2 | | 2 | 0 | 4 |
| Course duration in the curriculum - Total of hours curriculum | | | | |
| Lecture | Seminar | Lab | Project | Total ($NOAD_{sem}$) |
| 28 | | 28 | 0 | 56 |

| | | |
|-----------------------------------------------------------------------------|--|------------|
| Distribution of hours for individual study | | No. hours |
| Individual study using course handbooks, bibliography and notes | | 20 |
| Additional documentation in library and on specialized electronic platforms | | 10 |
| Preparing seminars / labs, homework, essays and portfolios | | 5 |
| Tutoring | | 5 |
| Exam preparation | | 16 |
| Total hours for individual study ($NOSI_{sem}$) | | 56 |
| Total hours per semester ($NOAD_{sem} + NOSI_{sem}$) | | 112 |

4. Prerequisites (if applicable)

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|--------------|------------------------------------------------------------|
| Curriculum | Advanced Programming, Basic Software Engineering |
| Competencies | Java technologies, Design patterns, Software Architectures |

5. Conditions (if applicable)

| | |
|---------------------------|----------------------------------------------------------------------------------------------|
| course materials | Study the recommended scientific papers; Video-projector, Blackboard |
| sem/lab/project materials | Lab Room with computers having installed the necessary software tools (see the applications) |

6. Specific competences acquired

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|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Professional competence | C4 Improvement performances hardware systems, and software Communications C6 Designing systems smart |
| Transversal competences | CT2 Identification, description and routing project management processes, with taking on the different roles in the team and clear and concise description, verbally and in writing, in Romanian language and in a language of circulation international, results from the activity |

7. Objectives (based on the specific grid for the accumulated competences)

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|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| General objective | Object-Oriented Software Construction |
| Specific objectives | Understanding what is a complex system, and complexity management Working with Object Oriented Design Patterns Learning to Think in the Abstract |

8. Contents

| Course | No. hours |
|--------------------------------------------------|-----------|
| Software Engineering - Overview | 2 |
| Software Development Methodologies | 3 |
| BPM. Requirements Modeling. UML, SysML | 4 |
| System Analysis. | 2 |
| Transition to Design | 2 |
| Design Patterns | 2 |
| Implementation | 3 |
| Testing and Verification | 4 |
| Model Driven Architecture | 6 |
| | 28 |
| Labs | No. hours |
| Requirements. UML: UseCase, UC Diagrams | 2 |
| Building the Software Requirement Specifications | 2 |
| CRC- based Design | 4 |
| Detailed Design. | 4 |
| Development Tools | 4 |
| System Architecture | 4 |
| Automated Testing. | 4 |

| | |
|-------------------------|-----------|
| Marks | 4 |
| Total lab hours: | 28 |

Teaching methods

| | | |
|----------------------------|-------------------------|---------|
| Discussions, Presentations | Language of instruction | English |
|----------------------------|-------------------------|---------|

References

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|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended reading | Martin Fowler, Kendall Scott - UML Distilled, second edition Addison-Wesley, 2000 |
| | Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides - Design Patterns, Elements of Reusable Object-Oriented Software, Addison-Wesley, 1995 |
| | Larman C.: Applying UML and Patterns, Prentice Hall, 2002 (pdf). |
| | Dorin Sima – Elemente de inginerie software – Ed. ULBS, 2003 |
| | SOMMERVILLE, Ian; <i>Software Engineering</i> , Boston; Columbus; New York: Pearson, 2011 |
| More references | www.acm.org |
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9. Linking course content with expectations of the epistemic community representatives, professional associations and employers' representatives in the field related to the program

Curricula are continuously updated based on the most prestigious international text-books and also based on the most relevant progresses in this field (as these developments are presented in top-level scientific reviews, research projects and international conferences).

10. Evaluation

| Type | Evaluation criteria | Evaluation methods | Percentage in final grade | Obs.* |
|----------------------------------|----------------------|----------------------|---------------------------|-------|
| Course | Assesments | Writing Work | 10% | CPE |
| | Exam | Writing Exam | 30% | CEF |
| Lab | Scientific Reports | Presentations | 5% | nCPE |
| | Applications | Projects Evaluations | 15% | CPE |
| | State of the art | Presentations | 10% | nCPE |
| Project | Knowing Technologies | | 30% | nCPE |
| | | | | |
| Minimum standard of performance | | | | |
| 50% after suming column 4 values | | | | |

(*) REP – required for exam participation; nREP – not required for exam participation; RFE – required for final evaluation.

Date of completion:

Date of approval in the Department:.....

| | Position, title, first name, surname | Signature |
|--------------------|--------------------------------------|-----------|
| Course instructor | conf. Dr. Ing. SIMA Nicolae Dorin | |
| Head of department | Prof. Eng. Daniel VOLOVICI, PhD | |