

**UNIVERSITY OF CRAIOVA**  
**DEPARTMENT: AUTOMATICS, ELECTRONICS AND**  
**MECHATRONICS**  
**MASTER: INFORMATION TECHNOLOGIES IN SYSTEM**  
**ENGINEERING**

**1-ST YEAR**

1. Operating systems
2. Image processing Software
3. Haptic interfaces
4. Geographical systems
5. Geographical systems – project
6. Research and design management
7. Software applications for real-time applications
8. Automotive control
9. Advanced techniques for numeric signal processing
10. Virtual reality
11. Virtual reality - project
12. Communication systems and networks
13. Communication systems and networks - project

**2-ND YEAR**

1. Network control systems
2. Network control systems - project
3. Non-linear biodynamics. Applications to artificial intelligence
4. Medical information systems
5. Information systems quality standards
6. Informatic systems – project
7. Scientific research activity
8. Dissertation paper internship

## 1-st YEAR

### SUBJECT : OPERATING SYSTEMS

**NUMBER OF CREDIT POINTS:** 6

**SEMESTER:** I

**COURSE TYPE:** core course

**COURSE OBJECTIVES:** The course aims at developing the knowledge on operating systems functions, especially processor planning, process and execution wire synchronization, interblocking avoidance, memory management and filing systems.

**COURSE CONTENT:** Introduction. Operating systems principles. Process management. Process synchronization. Process interblocking. Memory management. Virtual memory. Filing systems. Filing systems implementation.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Andrew S. Tanenbaum - Modern Operating Systems, Prentice Hall, 2001.

Andrew S Tanenbaum and Albert S Woodhull - Operating Systems Design and Implementation, Prentice Hall, 2006.

Andrew S. Tanenbaum - Distributed Operating Systems, Prentice Hall, 1995.

Avi Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts - John Wiley & Sons, Inc., 2004.

Abraham Silberschatz, Peter Baer Galvin - Operating Systems Concepts with Java, Westminster College, 2004.

### SUBJECT : IMAGE PROCESSING SOFTWARE

**NUMBER OF CREDIT POINTS:** 6

**SEMESTER:** I

**COURSE TYPE:** core course

**COURSE OBJECTIVES:** The course aims at introducing the basic concepts regarding the development of the skills necessary to analyse, design and develop image acquisition and processing applications.

**COURSE CONTENT:** Introduction to image acquisition and processing. Image analysis. Image restoring. Image quality increase. Image compression. Programme systems for image processing. Image processing applications.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Computer Imaging: Digital Image Analysis and Processing , Scott E Umbaugh, The CRC Press, Boca Raton, FL, January 2005, 659 pages, CVIPtools CD-ROM with book, ISBN: 0-84-932911.

Computer Vision and Image Processing: A Practical Approach Using CVIPtools , S. E Umbaugh, Prentice Hall PTR, Upper Saddle, NJ, 1998, 504 pages, includes CD-ROM with software, ISBN 0 -13 -264599-8.

Machine Vision : Theory, Algorithms, Practicalities, E. R. Davies, Elsevier, 2005.

Achizitia, prelucrarea si recunoasterea imaginilor, Cojocaru, D, 2003, Editura Universitaria, ISBN 973-8043-146-6, 340 pag.

Fuzzy Techniques in Computer Vision, Tănăsie, R. T., Cojocaru, D., 2006, Editura Universitaria, ISBN 973-742-428-X, 978-973-742-428-0, 105 pag.

### SUBJECT : HAPTIC INTERFACES

**NUMBER OF CREDIT POINTS:** 6

**SEMESTER:** I

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course introduces the basic concepts referring to tactile, visual and auditive sensory knowledge, using haptic interfaces and technologies and man-computer interaction as a communication means.

**COURSE CONTENT:** Introduction to course topics. Methods and techniques of intercation between the haptic interface and virtual and real medium. The haptic perception psychophysics of mechanical properties. Tactile sensory and actuator systems. Proprioception and force-type reaction. Deformable objects simulation. Audio haptic structures and architectures. Mechanical structures and architectures of haptic devices. The design algorithms of a haptic interface. The design algorithms of a haptic interface meant for man-robot communication. Haptic interfaces for the interaction man- biological media. Haptic interfaces for elderly and disabled people.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Adelstein, B. D., & Rosen, M. J. (1990). A High Performance Two Degree-of-Freedom Kinesthetic Interface. In N. Durlach (Ed.), Proceedings of the Engineering Foundation Conference on Human Machine Interfaces for Teleoperators and Virtual Environments, Santa Barbara, CA.

Bergamasco, M. (1992). Design of Hand Force Feedback Systems for Glove-like Advanced Interfaces. In Proceedings of the 1992 IEEE Workshop on Robot and Human Communication, Tokyo, Japan.

Martin Grunwald ,(2008), Human Haptic Perception: Basics and Applications, ISBN-10: 3764376112 , ISBN-13: 978-3764376116, Birkhäuser Basel.

Bolt, R. A. (1982). I. Virtual manual-graphical space; II: Tactual Simulation, MIT Architecture Machine Group.

Salisbury, K., & Massie, T. (1994). The PHANToM Haptic Interface. In Proc. AAAI Spring Symposium Series, Toward Physical Interaction and Manipulation, Stanford, CA.

### SUBJECT : GEOGRAPHICAL INFORMATION SYSTEMS

**NUMBER OF CREDIT POINTS:** 5

**SEMESTER:** I

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course introduces the basic concepts about geographical informatin systems (GIS – Geographic Information System), considered as a whole including hardware, software, personnel, data and analysis methods.

**COURSE CONTENT:** Introduction to GIS; GIS structure; Data use in GIS. Data and model types. Advantages and disadvantages of using a GIS. Geomedia GIS software package (Intergraph); ArcGIS ESRI software package; GIS application – environment monitoring systems.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Băduț, M. - Sisteme Informatice Geografice - fundamente practice, Ed. ALBASTRA, 2004.

Dimitriu, G. - Sisteme Informatice Geografice, Ed. ALBASTRA, 2008.

Fischer, M., Nijkamp, P. - Geographic Information Systems, Spatial Modelling and Policy Evaluation, Springer Verlag, 1993.

Havraneck, T.J. - Modern Project Management Techniques for the Environmental Remediation Industry, St. Lucie Press, CRC Press, SUA, 2000.  
<http://freegis.org> (Software GIS free).

**SUBJECT : GEOGRAPHICAL INFORMATION SYSTEMS-PROJECT**

**NUMBER OF CREDIT POINTS: 1**

**SEMESTER: I**

**COURSE TYPE:** core course

**PROJECT OBJECTIVES:** The project is meant to systematize theoretical knowledge and to create practical GIS abilities through the acquisition, management, analysis and visualization of the data spatially reported in order to solve complex planning and management issues in various domains.

**COURSE CONTENT:** GIS Design – GeoMedia (Intergraph); GIS – ArcGIS (ESRI) Design. GIS applications- environment monitoring systems; GIS applications – management and transportation.

**TEACHING LANGUAGE:** Romanian

**EVALUARE:** project

**BIBLIOGRAPHY:**

- Băduț, M. - Sisteme Informatice Geografice - fundamente practice, Ed. ALBAȘTRA, 2004.  
Dimitriu, G. - Sisteme Informatice Geografice, Ed. ALBAȘTRA, 2008.  
Fischer, M., Nijkamp, P. - Geographic Information Systems, Spatial Modelling and Policy Evaluation, Springer Verlag, 1993.  
Havraneck, T.J. - Modern Project Management Techniques for the Environmental Remediation Industry, St. Lucie Press, CRC Press, SUA, 2000.  
<http://freegis.org> (Software GIS free).

**SUBJECT : RESEARCH AND DESIGN MANAGEMENT**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: I**

**COURSE TYPE:** complementary

**COURSE OBJECTIVES:** Cursul urmărește: prezentarea principalelor laturi ale managementului cercetării științifice, bazându-se pe ideea ca învățământul și cercetarea științifică sunt factori determinanți ai progresului și dezvoltării, ai modernizării economice, sociale și culturale. Managementul cercetării și proiectării reprezintă un element strategic al dezvoltării durabile și urmărește să orienteze tinerii absolvenți pe drumul cercetării științifice și perfecționarea pregătirii acestora ca viitori cercetători, care își vor desfășura activitatea în cadrul UE asigurându-le un ansamblu de cunoștințe necesare și suficiente pentru a-i orienta în domeniile de vârf ale cercetării științifice.

**COURSE CONTENT:** Introduction: Defining the basic notions; Technical creativity and innovation, competition and research-development; Elements of research-development-innovation management; The concept of creativity and creativity methods; Technological prognosis and R-D planning; R-D activity planning and organization; Innovation management; Research and design management in a company; Project management; Technological information protection; Strategic management; Scientific research policy in Romania; Legislation and research-development-innovation process.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

- Vinătoru M. - Managementul proiectelor, 2008, Ed. Universitaria Craiova.

I. Chein - The field of Action Research, 2005, Sage Publications, California.

O.Plesa, F.Ciote - Inovarea și sfidările schimbării, Editura Multimedia, 1996.

Legea nr.324/8 iulie privind Cercetarea științifică și dezvoltarea tehnologiei.

HG nr.328/28 aprilie 2005 privind Cercetarea de Excelență..

**SUBJECT : SOFTWARE STRUCTURES FOR REAL-TIME APPLICATIONS**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: II**

**COURSE TYPE:** core course

**COURSE OBJECTIVES:** The course presents the basic concepts concerning the issues of real-time process management in the following directions: methods and possibilities of making and implementing an executive in real-time, the design and implementation of the numeric algorithms for process management, organizing management applications controlled by a real-time executive.

**COURSE CONTENT:** Calculus systems in real-time. Basic concepts in real-time programming. Real-time primitives for resources management. Continuous systems discretization. Numeric control algorithms. Programming applications in real-time using a real-time executive.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

- Auslander D.,Tham C. - Real-time software for control: program examinationples in C, Prentice Hall, 1990.  
Bennet, S. - Real-time Computer Control, Prentice Hall, 1988.  
Buhr R., Bailey D. - An Introduction to Real Time Systems from Design to Networking with C++, Prentice Hall Inc., 1998.  
Călin S., Dumitrache I. - Reglarea numerică a proceselor tehnologice, Ed. Tehnică, București, 1984.  
Holzner S. - Borland C++ Programming , Brady Books, New York, 1992.

**SUBJECT : AUTOMOTIVE CONTROL**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: II**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course aims at introducing the basic concepts concerning the implementation of control systems in automobiles: the general presentation of the main control systems, AUTOSAR as a design standard in automobile industry, AUTOSAR components details.  
**COURSE CONTENT:** Electronic automotive systems; An overall view on software automotive architecture; AUTOSAR architecture (Automotive Open System Architecture); Microcontroller Layer. Role and Functionality; ECU Abstraction Layer. Role and functionality; Services Layer. Role and functionality; RTE (Run Time Environment); Application Layer.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

- Documentație Matlab/Simulink/RTW și xPC.  
Documentație Quanser.  
Documentație AUTOSAR.

**SUBJECT : ADVANCED TECHNIQUES FOR NUMERIC SIGNAL PROCESSING**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: II**

**COURSE TYPE:** core course

**COURSE OBJECTIVES:** The course covers a large domain of theory and applications concerning the advanced processing of numeric signals in the communication and processing systems of multimedia, biomedical signals. The purpose is to obtain competences and practical abilities in design, modeling, implementing and numeric signal processing.

**COURSE CONTENT:** Introducere. Problematika prelucrării semnalelor. Domenii de aplicație a prelucrării numerice a semnalelor; Modularea sigma-delta pentru CAN; Estimarea spectrală a semnalelor; Filtre numerice; Aplicații ale prelucrării numerice a semnalelor; Procesoare numerice de semnal.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Oppenheim A.V., Shafer R.W., Buck J.R. - Discrete-Time Signal Processing (Second Edition), Prentice-Hall, 1999.

Lathi B.P. - Signal Processing and Linear Systems, Berkeley Cambridge Press, 1998.

Haddad, R.A., Parsons T.W. - Digital Signal Processing – Theory, Applications and Hardware, Computer Science Press, 1991.

Marin, C. - Sisteme discrete în timp, Ed. Universitaria, Craiova, 2005.

Marin C., Popescu D. - Teoria sistemelor și reglare automată, Ed. Sitech, Craiova, 2007.

**SUBJECT : VIRTUAL REALITY**

**NUMBER OF CREDIT POINTS: 5**

**SEMESTER: II**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The purpose is to introduce the basic knowledge on virtual scenes making by using the computer. Course objectives converge towards the use of virtual reality in three directions: virtual production, virtual robotics and collaborative engineering.

**COURSE CONTENT:** Introduction to virtual reality. VRML basic concepts. Nodes. Prototypes and event processing. Other languages to describe virtual reality. Virtual reality applications.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Popescu, D., Sendrescu, D., Realitate virtuala, Ed. Universitaria, 2002.

Hartman J., s.a., The VTML 2.0 Handbook, Ed. Addison Wesley, 1996.

Ionescu F., Grafica in realitatea virtuala, Ed. Tehnica, 2000.

Diehl S., Distributed Virtual Worlds, Ed. Springer Verlag, 2001.

Pesce, VRML and Java, ViewSource, Netscape Communications, 1999.

**SUBJECT : VIRTUAL REALITY -PROJECT**

**NUMBER OF CREDIT POINTS: 1**

**SEMESTER: II**

**COURSE TYPE:** specialty

**PROJECT OBJECTIVES:** Project classes have the role to create the practical competences necessary to program virtual scenes and to interact with the virtual medium. Course objectives converge towards the use of virtual reality in three directions: virtual production, virtual robotics and collaborative engineering.

**COURSE CONTENT:** Virtual applications making; production systems modeling; virtual robotics.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** project

**BIBLIOGRAPHY:**

Popescu, D., Sendrescu, D., Realitate virtuala, Ed. Universitaria, 2002.

Hartman J., s.a., The VTML 2.0 Handbook, Ed. Addison Wesley, 1996.

Ionescu F., Grafica in realitatea virtuala, Ed. Tehnica, 2000.

Diehl S., Distributed Virtual Worlds, Ed. Springer Verlag, 2001.

Pesce, VRML and Java, ViewSource, Netscape Communications, 1999.

**SUBJECT : COMMUNICATION SYSTEMS AND NETWORKS**

**NUMBER OF CREDIT POINTS: 5**

**SEMESTER: II**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course is meant to get the student acquainted with the technologies specific to data transmission, to make him acquire technical knowledge in fixed and mobile data transmission, communication network, the evaluation of the performances of a communication system applying the theoretical knowledge and practical skills.

**COURSE CONTENT:** Local industrial networks. Introductory notions. Network security. Wide band radio transmission systems. Wireless networks. Advanced communication systems.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Bănică I. - Rețele de comunicații între calculatoare, Editura Teora, București, 1998.

Carbon M. - Exercices résolus de mathématiques du signal, Ed. Dunod Paris 1992.

Dobrescu R. - Transmiterea datelor, Editura Academiei Române, București, 2005.

Duvant P. - Traitement du signal, Ed. Hermes – 1990.

Fehér K. - Comunicatii digitale avansate, vol. I, Ed. Tehnica Bucuresti 1993.

**SUBJECT : COMMUNICATION SYSTEMS AND NETWORKS- PROJECT**

**NUMBER OF CREDIT POINTS: 1**

**SEMESTER: II**

**COURSE TYPE:** specialty

**PROJECT OBJECTIVES:** The course is meant to get the student acquainted with the technologies specific to data transmission, to make him acquire technical knowledge in fixed and mobile data transmission, communication network, the evaluation of the performances of a communication system applying the theoretical knowledge and practical skills.

**COURSE CONTENT:** Modulated signals use in data transmission (MA, MF, MP, MDP). Using delta modulation in data transmission. Data acquisition in industrial processes. Serial transmission. Using process highways. Data protection. Error detecting and correcting codes. Basic band transmission. Impulse modulation. Line equalizer design. Making programmes for data compression.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** project

**BIBLIOGRAPHY:**

Bănică I. - Rețele de comunicații între calculatoare, Editura Teora, București, 1998.

Carbon M. - Exercices résolus de mathématiques du signal, Ed. Dunod Paris 1992.

Dobrescu R. - Transmiterea datelor, Editura Academiei Române, Bucuresti, 2005.

Duvant P. - Traitement du signal, Ed. Hermes – 1990.

Feher K. - Comunicatii digitale avansate, vol. I, Ed. Tehnica Bucuresti 1993.

## 2-ND YEAR

### **SUBJECT : NETWORK CONTROL SYSTEMS**

**NUMBER OF CREDIT POINTS:** 5

**SEMESTER:** I

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course aims at introducing the basic concepts regarding the implementation of control systems distributed within the network; the general presentation of industrial networks, delays introduced in controlling networks, the simultaneous design of task and controller planner.

**COURSE CONTENT:** Design paradigms and methods of network control systems; Multitasking; communication resources division; industrial networks; calculus and communication resources division. Network distributed control.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Documentație Matlab/Simulink/RTW si xPC.

Documentație Quanser.

Documentație TrueTime.

Documentație rețele CAN, LIN.

### **SUBJECT : NETWORK CONTROL SYSTEMS-project**

**NUMBER OF CREDIT POINTS:** 1

**SEMESTER:** I

**COURSE TYPE:** specialty

**OBIECTIVELE PROIECT:** The project applies the concepts presented during the course by modelation, simulation or applications.

**COURSE CONTENT:** Real time operating system implementation xPC sub Matlab/Simulink/RTW. Testing the real time operating system implementation xPC Implementarea sistemului de operare de timp real. (UDP) sub xPC network communication testing. Remote control for a MCC sub xPC. Remote control for 2 MCC distributed in different network nodes sub xPC.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** project

**BIBLIOGRAPHY:**

Documentație Matlab/Simulink/RTW si xPC.

Documentație Quanser.

Documentație TrueTime.

Documentație rețele CAN, LIN.

### **SUBJECT : NON-LINEAR BIODYNAMICS. APPLICATIONS TO ARTIFICIAL INTELLIGENCE**

**NUMBER OF CREDIT POINTS:** 6

**SEMESTER:** I

**COURSE TYPE:** core course

**COURSE OBJECTIVES:** The course is an introduction to quantitative theory and calculus models specific to biological brain. Three levels of abstractization will be covered: starting from the level of the neuron and finishing with the high level models specific to neuronal networks. Specific applications will be discussed.

**COURSE CONTENT:** Introduction to natural neural calculus; biological neuron calculus; the visual system; memory; decision-making. Introduction to natural paradigm calculus. The neural dynamic unit. Dynamic neural networks. Structures. Dynamic neural networks stability. Learning and adaptation in dynamic neural networks. Binary associative memory with reaction; other applications of dynamic neural networks.

**TEACHING LANGUAGE: Romanian**

**EVALUATION:** examination

**BIBLIOGRAPHY:**

D. Danciu – Sisteme cu mai multe echilibre. Aplicații la rețele neurale., Ed. Universitaria, Craiova , ISBN 973-742-555-3, 2006.

M. Madan Gupta, Liang Jin, Noriyasu Homma – Static and Dynamic Neural Networks. From Fundamentals to Advanced Theory., Ed. IEEE Press – Willey Interscience, 2003.

J.C. Principe, N.R. Euliano, W.C. Lefebvre – Neural and adaptive systems. Fundamentals through simulations. Ed. Wiley & Sons, 2000.

\*\*\* Toolbox Neural Networks – MathWorks.

**SUBJECT : MEDICAL INFORMATION SYSTEMS**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: I**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course gets the future specialist accustomed to information technologies applied to the medical field, it allows the acquiring of the technical knowledge in the field of biological signals acquisition, transmission and processing, physiological systems modeling and simulation, computer-assisted diagnosis and monitorization. Tele-medicine application (e-Health).

**COURSE CONTENT:** Biological signals acquisition; physiological systems modeling and simulation; biomedical images acquisition and processing; computer-assisted diagnosis and monitorization; Tele-medicine application (e-Health)

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Armitage P., Berry G. Statistical methods in medical research (2nd Ed.). Blackwell Scientific Publications, Oxford, 1987.

Iancu Ionela, Iancu E., Modelare și simulare în fiziologie Editura Universitaria, Craiova, 2003.

Lungeanu D, Mihalas G. I. Informatica medicala si biostatistica (Editia a 2-a), Eurobit, Timisoara, 2008.

Popescu O., Enatescu V., Farcas D., Mihalas G. I., Petrescu O., Popa S. - Informatica Medicala, Ed. Medicala, Bucuresti, 1988.

Shortliffe E. H., Perreault L. E. Medical Informatics. Computer Applications in HealthCare and Biomedicine (2nd Edition), Springer-Verlag, 2001.

**SUBJECT : QUALITY STANDARDS OF INFORMATION SYSTEMS**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: I**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The course aims at introducing and ensuring the assimilation of the basic concepts, methods and instruments in the field of software quality assurance, in order to assume the management roles in the software development, management and maintainance.

**COURSE CONTENT:** Introduction to software quality assurance; the components of quality assurance system; software quality factors. Pre-design quality components. Design quality components. Software testing- strategies and implementation. The assurance of high quality maintainance Software components. CASE Instruments (Computer Assisted Software Engineering); Infrastructure components to ensure software quality; Infrastructure components to ensure software quality- part 2; Software project evolution/

progress control; Software quality metrics and costs; Software quality standards, certifications, and evaluation; Personnel organisation to ensure software quality.

**TEACHING LANGUAGE: Romanian**

**EVALUATION: examination**

**BIBLIOGRAPHY:**

Galini Daniel, Software Quality Assurance: From theory to implementation, Pearson Education, Ltd, 2004. ISBN 0201-70945-7.

IEEE Standards: Software Engineering, Volumes One–Four. 1999.

Schwalbe Kathy, Information Technology Project Management, 3rd edition. Thompson Learning Inc., 2004, ISBN 0-619-15984-7.

Patton Ron. Software Testing. 2nd edition. SAMS Publishing, 2006, ISBN 0-672-32798-8.

Kan Stephen, Metrics and Models in Software Quality Engineering, 2nd edition, Pearson Education Inc., 2003, ISBN 0-201-72915-6, Macmillan Publishing Company, New York, 1992.

**SUBJECT : INFORMATION SYSTEMS - PROJECT**

**NUMBER OF CREDIT POINTS: 6**

**SEMESTER: I**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** The project is meant to detail the processes, methods and activities which ensure software quality (i.e. software verification, validation, review, testing, and the concrete planning of these activities).

**COURSE CONTENT:** Software engineering introduction. Software processes. Source code management. Reliability studies. Project management. Legal aspects of software engineering. System requirements analysis – part one and two. System usage potential. General architecture and concepts of the system. Detailed architecture and concepts of the system. Object-oriented design. Reliability. Calculus system performances. Human resources. Business aspects in software engineering. System delivery. Software development risks.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** examination

**BIBLIOGRAPHY:**

Frederick P. Brooks, Jr., The Mythical Man Month. Addison-Wesley, 1995, ISBN 978-0201835953.

Sommerville, Ian, Software Engineering, 8th Edition. Addison-Wesley , 2006, ISBN 978-0321313799.

Charles Pfleeger, Shari Lawrence, Software Engineering Theory and Practice, 3rd edition. Prentice- Hall, 2005, ISBN 978-0131469136.

Grady Booch, R. Makshimchuk, M. Engel, B. Young, J. Conallen, K. Houston, Object-Oriented Analysis and Design with Applications, 3rd edition. Benjamin/Cummings, 1994, ISBN 978-0201895513.

Perdita Stevens, Using UML Software Engineering with Objects and Components, 2nd edition, Addison-Wesley, 2006, ISBN 978-0321269676.

**SUBJECT : SCIENTIFIC RESEARCH ACTIVITY**

**NUMBER OF CREDIT POINTS: 15**

**SEMESTER: II**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** as applicable.

**COURSE CONTENT:** as applicable.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** written assignment

**BIBLIOGRAPHY:** as applicable.

**SUBJECT : DISSERTATION PAPER - INTERNSHIP**

**NUMBER OF CREDIT POINTS: 15**

**SEMESTER: II**

**COURSE TYPE:** specialty

**COURSE OBJECTIVES:** as applicable.

**COURSE CONTENT:** as applicable.

**TEACHING LANGUAGE:** Romanian

**EVALUATION:** written assignment

**BIBLIOGRAPHY:** as applicable.

Dean,

Professor Eugen BOBAȘU, PhD