

TOPICS AND BIBLIOGRAPHY

for the Contest held to fill

**Position no. 3, Professor, from the Payroll of the Informatics Department,
including the following disciplines:**

- **Biomedical System Modeling**
- **Software Engineering**
- **Research Methodology**

TOPICS: Biomedical System Modeling

1. Modeling of the blood pressure and other slow changing biomedical signals.
2. Modeling of the ECG and other fast changing biomedical signals.
3. Rhythm analysis and R wave recognition methods.
4. Compression methods of the ECG signal.
5. Biomedical image processing. Pattern recognition from captured biomedical images.
6. Semi-automatic diagnostic systems.
7. Modeling of the heart.

Bibliography:

1. Mathematics for dynamic modelling Edward Beltrami, Academic Press, Inc, London, 1987
2. Biomechanics of the musculo-skeletal system BM Niggo, W Herzog, Wiley, 1995
3. Bio-fluid mechanics, H Power, Computational Mechanics Publications, Southampton, UK, 1995
4. C. Cobelli, D.M. Foster: Compartmental models: Theory and Practice Using the SAAM II Software System Adv. Exp. Med. Biol., 445 (1998), pp. 79–101
5. Baianu, I. C. 1987, Computer Models and Automata Theory in Biology and Medicine., in M. Witten (ed.), *Mathematical Models in Medicine*, vol. 7., Ch.11 Pergamon Press, New York, 1513-1577.
6. Northrop, R. B.: Endogenous and exogenous regulation and control of physiological systems. Boca Raton, FL: Chapman & Hall/CRC, cop. 2000. ISBN 0849396948.
7. Ljung, L.: System identification: theory for the user. 2nd ed. Englewood Cliffs: Prentice-Hall, 1999. ISBN 0136566952.

TOPICS: Software Engineering

1. Software modeling with UML: Use Cases, State Machine Diagrams. Example.
2. Software modeling with UML: Sequence Diagrams, Activity Diagrams. Example.
3. Software modeling with UML: Class Diagrams, Data-flow diagrams. Example.
4. Software development methodologies: Waterfall, Spiral, RUP.
5. Software development methodologies: V-Model, Agile, Scrum.
6. Software quality.
7. Software testing.

Bibliography:

1. Dumitru Radoiu, *Software Engineering*, Lecture Notes
2. Pressman - *Software Engineering* - <http://www.rspa.com/spi/index.html>
3. Bruegge, Dutoit, *Object-Oriented Software Engineering* - <http://www.bruegge.in.tum.de/teaching/ss99/CBSE/book/>
4. Timothy C. Lethbridge & Robert Laganière. *Object-Oriented Software Engineering: Practical Software Development using UML and Java* (Second Edition). McGraw-Hill, 2005.
5. M.R.V. Chaudron, J.F. Groote, K.M. van Hee, C. Hemerik, L.J.A.M. Somers and T. Verhoeff. "Software Engineering Reference Framework". Technical Report CS-Report 04-039, *Computer Science Reports*, Department of Mathematics and Computer Science, Eindhoven University of Technology, Eindhoven, The Netherlands, 2004.
6. Jessica Keyes. *Software Engineering Handbook*. Auerbach Publications (CRC Press), 2003.
7. Roger S. Pressman. *Software Engineering: A Practitioner's Approach* (Sixth Edition, International Edition). McGraw-Hill, 2005.
8. Ian Sommerville. *Software Engineering (Seventh Edition)*. Addison-Wesley, 2004.
9. Hans van Vliet. *Software Engineering: Principles and Practice (Second Edition)*. Wiley, 1999.

TOPICS: Research Methodology

1. Presentation of various scientific databases: Springer, ScienceDirect, Hindawi. Selection of a scientific paper.
2. The structure of a scientific paper.
3. Classification of the universities and scientific journals.
4. Study of bibliography in a research area.
5. Writing methodology of a scientific paper.

Bibliography:

1. American Psychological Association. (2010). *Publication manual of the American Psychological Association*. Washington DC: APA.
2. Cone, J.D. & Foster, S.L. (2006). *Dissertations and theses from start to finish*. Washington, DC: APA.
3. Council of Science Editors. (2006). *Scientific style and format: The CSE manual for authors, editors, and publishers*. 7th edition. Reston, VA: The Council.
4. Gilpin, A.A. (2000). *A guide to writing in the sciences*. Toronto, Canada: U Toronto P.
5. Gustavii, B. (2003). *How to write and illustrate a scientific paper*. New York, NY: Cambridge.
6. Modern Language Association of America. (2009). *MLA handbook for writers of research papers* (7th ed.). New York, NY: Modern Language Association of America.
7. Turabian, K.L. (2007). *A manual for writers of research papers, theses, and dissertations*. Chicago, IL: University of Chicago Press.
8. VanderMay, R., Meyer, V., Van Rys, J., Kemper, D. and Sebranek, P. (2006). *The college writer: A guide to thinking, writing, and researching*. Boston, MA: Houghton Mifflin.
9. <http://scientificbulletin.upm.ro/en/>

DIRECTOR DEPARTMENT,

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