

## SYLLABUS

### 1. Program information

|                                   |                                                                                     |
|-----------------------------------|-------------------------------------------------------------------------------------|
| 1.1 Higher education institution  | Technical University of Cluj-Napoca                                                 |
| 1.2 Faculty                       | Faculty of Electronics, Telecommunications and information Technology               |
| 1.3 Department                    | Communications                                                                      |
| 1.4 Field of study                | Electronic Engineering, Telecommunications and Information Technologies             |
| 1.5 Cycle of study                | Bachelor of Science                                                                 |
| 1.6 Study program / Qualification | Telecommunications Technologies and Systems/ Engineer, Applied Electronics/Engineer |
| 1.7 Form of education             | IF – full-time education                                                            |

### 2. Course information

|                                                                  |                                                                                                                                                                                                                                    |              |                           |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------|
| 2.1 Course title                                                 | Switching and Routing Systems                                                                                                                                                                                                      | Course code  | TST-E39.00/<br>EA-E108.00 |
| 2.2 Course coordinator                                           | Professor Virgil DOBROTA, Ph.D. - <a href="mailto:Virgil.Dobrota@com.utcluj.ro">Virgil.Dobrota@com.utcluj.ro</a>                                                                                                                   |              |                           |
| 2.3 Seminar/ laboratory/ project/ practical activity coordinator | Assist. Prof. Andrei-Bogdan RUS, Ph.D - <a href="mailto:Bogdan.Rus@com.utcluj.ro">Bogdan.Rus@com.utcluj.ro</a><br>Assist. Robert BOTEZ, Ph.D. student - <a href="mailto:Robert.Botez@com.utcluj.ro">Robert.Botez@com.utcluj.ro</a> |              |                           |
| 2.4 Year of study                                                | 3                                                                                                                                                                                                                                  | 2.5 Semester | 6                         |
| 2.6 Type of assessment                                           | E                                                                                                                                                                                                                                  |              |                           |
| 2.7 Course status                                                | Formative category                                                                                                                                                                                                                 |              | DS                        |
|                                                                  | Optionality                                                                                                                                                                                                                        |              | DOB                       |

### 3. Estimated total time

|                                                                                                    |    |           |             |    |             |  |                |    |             |    |                        |  |
|----------------------------------------------------------------------------------------------------|----|-----------|-------------|----|-------------|--|----------------|----|-------------|----|------------------------|--|
| 3.1 Hours per week                                                                                 | 4  | of which: | 3.2 Lecture | 2  | 3.3 Seminar |  | 3.3 Laboratory | 2  | 3.3 Project | 1  | 3.3 Practical training |  |
| 3.4 Hours per semester                                                                             | 70 | of which: | 3.5 Lecture | 28 | 3.6 Seminar |  | 3.6 Laboratory | 28 | 3.6 Project | 14 | 3.3 Practical training |  |
| 3.7 Time distribution (hours per semester) for individual study and assessment:                    |    |           |             |    |             |  |                |    |             |    |                        |  |
| (a) Assessment                                                                                     |    |           |             |    |             |  |                |    |             |    | 3                      |  |
| (b) Study using textbook, course materials, bibliography, and notes                                |    |           |             |    |             |  |                |    |             |    | 14                     |  |
| (c) Additional documentation in the library, on specialized electronic platforms, and in the field |    |           |             |    |             |  |                |    |             |    | -                      |  |
| (d) Preparation for seminars/laboratories, assignments, reports, portfolios and essays             |    |           |             |    |             |  |                |    |             |    | 10                     |  |
| (e) Tutoring                                                                                       |    |           |             |    |             |  |                |    |             |    | 3                      |  |
| (f) Other activities                                                                               |    |           |             |    |             |  |                |    |             |    | 0                      |  |
| 3.8 Total hours of individual study and assessment (sum of (3.7(a))...3.7(f))                      |    |           |             |    |             |  |                |    | 30          |    |                        |  |
| 3.9 Total hours per semester (3.4+3.8)                                                             |    |           |             |    |             |  |                |    | 100         |    |                        |  |

|                        |   |
|------------------------|---|
| 3.10 Number of credits | 4 |
|------------------------|---|

#### 4. Prerequisites (where applicable)

|                  |                                       |
|------------------|---------------------------------------|
| 4.1 curriculum   | N/A                                   |
| 4.2 competencies | Graph theory, Mathematical statistics |

#### 5. Requirements (where applicable)

|                                                              |             |
|--------------------------------------------------------------|-------------|
| 5.1. for the development of the lecture                      | Cluj-Napoca |
| 5.2. for the development of the seminar/ laboratory/ project | Cluj-Napoca |

#### 6. Specific competencies acquired

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Professional competencies | <p>C4. Design, implementation and operation of data, voice, video and multimedia services. This is based on the understanding and the application of fundamental concepts in telecommunications and transmission of information</p> <p>C4.3 Explanation and interpretation of the main requirements and specific approach techniques for data, voice, video, multimedia transmissions</p> <p>C4.4 Use of the main specific parameters in evaluations based on the concept of quality of service in communications</p> <p>C4.5 Development of simple communications services</p> <p>C5. Selecting, installing, configuring and operating fixed or mobile telecommunications equipment. Equipping a site with usual telecommunications networks</p> <p>C5.1 Defining the principles of the main technologies for fixed and mobile telecommunications, through various transmission media</p> <p>C5.2 Explanation and interpretation of the technologies and of fundamental protocols for integrated fixed and mobile communications systems</p> <p>C5.3 Installation, configuration and exploiting of communications networks</p> <p>C5.4 Use of evaluation techniques and diagnostics for communications systems and equipment</p> <p>C5.5 Endowment with communications means of a location with a small/ medium degree of complexity</p> |
| Transversal competence    | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## 7. Expected learning outcomes

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge                   | <p><b>K2.</b> The student/ graduate explains and interprets theoretical and experimental results from mathematics, physics, chemistry, economics, technical drawing and computer science.</p> <p><b>K4.</b> The student/ graduate describes, identifies, summarizes concepts and elementary methods of signal acquisition, analysis and processing, implemented in systems with general-purpose processors or signal processors and their application in concrete problems</p> <p><b>K5.</b> The student/graduate describes, identifies, summarizes elementary concepts and methods regarding the architecture of computer systems, microcontrollers, programming languages and techniques and their application in concrete problems</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Skills                      | <p><b>S17.</b> The student/graduate evaluates, based on specific performance criteria, the type of computing system, its architecture and the way of use necessary for an efficient solution of concrete problems.</p> <p><b>S18.</b> The student/graduate specifies requirements, develops programs in general-purpose programming languages (C, etc.) and/or object-oriented (C++, Java, etc.), executes, debugs and interprets the results of the programs developed to solve a concrete problem.</p> <p><b>S19.</b> Modify the scope of an information and communications technology (ICT) system by adding or reallocating additional ICT system components, such as network components, servers, or storage media to meet capacity demands.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Responsibility and autonomy | <p><b>R1.</b> The student/graduate applies to the ethical and deontological values of the engineering profession.</p> <p><b>R2.</b> The student/ graduate employs logical reasoning, evaluation, and self-assessment in decision-making.</p> <p><b>R3.</b> The student/ graduate communicates effectively about engineering activities with a wide range of audiences.</p> <p><b>R4.</b> The student/ graduate is engaged in lifelong learning to acquire and implement knowledge as needed, using appropriate learning strategies</p> <p><b>R5.</b> The student/graduate promotes dialogue, cooperation, respect for others and interculturality.</p> <p><b>R6.</b> The student/ graduate works effectively as a team member or team leader.</p> <p><b>R7.</b> The student/ graduate is fluent in at least one international language in technical communication</p> <p><b>R9.</b> The student/ graduate demonstrates initiative and takes action to update their professional, economic, and organizational culture knowledge.</p> <p><b>R10.</b> The student/ graduate has honorable, responsible, and ethical behavior, in accordance with the law to ensure the reputation of the profession.</p> |

## 8. Course objectives (based on the grid of specific competencies acquired)

|                                     |                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.1 General objective of the course | Development of competences regarding switching and routing in telecommunications networks                                                                                                                                                                                                                                                       |
| 8.2 Specific objectives             | <ol style="list-style-type: none"> <li>1. Understanding the basic concepts regarding switching and routing algorithms</li> <li>2. Development of skills and abilities for configuring IP-based Asterisk telephone exchange</li> <li>3. Development of skills for virtualization of switches and routers and their cloud applications</li> </ol> |

## 9. Contents

| 9.1 Lecture                                                                                                                                                                                                                                                       | No. of hours | Teaching methods                                                                                                                 | Remarks                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 1. Digital Switching Functions. Single Stage Space-Division Switch. Classification of Multiple Stage Switches                                                                                                                                                     | 2            | Presentation, heuristic conversation, exemplification, problem presentation, teaching exercise, case study, formative evaluation | Use of .ppt presentation, projector, whiteboard |
| 2. Multiple Stage Switch with Complete Permutation Paths (Clos). Strictly Non-Blocking Three-Stage Clos Switch. Blocking Probabilities. Lee’s Method. Generalization of Clos Condition                                                                            | 2            |                                                                                                                                  |                                                 |
| 3. Multiple Stage Switches with Single Path (Banyan). Batcher-Banyan Switches. Software Package for the Simulation of Batcher-Banyan Switches                                                                                                                     | 2            |                                                                                                                                  |                                                 |
| 4. Multiple Stage Switches with Multiple Path. Time-Division Switching: T. Time-Space-Division Switching: TS                                                                                                                                                      | 2            |                                                                                                                                  |                                                 |
| 5. STS Switch. TST Switch. TSSST Switch. Examples of Telephone Exchanges and Switch Fabrics (optional). Switches in cloud                                                                                                                                         | 2            |                                                                                                                                  |                                                 |
| 6. Traffic Analysis. Characteristics of a Queueing System. Models for Clients Arrivals: Bernoulli, Poisson                                                                                                                                                        | 2            |                                                                                                                                  |                                                 |
| 7. M/M/1/∞ System. M/M/1/N System                                                                                                                                                                                                                                 | 2            |                                                                                                                                  |                                                 |
| 8. M/M/m/∞ System. Erlang C Formula. M/M/m/m System. Erlang B Formula.                                                                                                                                                                                            | 2            |                                                                                                                                  |                                                 |
| 9. M/D/m/∞ and M/D/1/∞ Systems. M/G/1/∞ System. Pollaczek-Khinchin Formula. Traffic Processing in Telecommunications                                                                                                                                              | 2            |                                                                                                                                  |                                                 |
| 10. Routing Algorithms. Basics of Routing: Definitions                                                                                                                                                                                                            | 2            |                                                                                                                                  |                                                 |
| 11. Bellman-Ford Algorithm. Dijkstra’s Algorithm                                                                                                                                                                                                                  | 2            |                                                                                                                                  |                                                 |
| 12. Floyd-Warshall Algorithm. Comparison between Bellman-Ford, Dijkstra’s and Floyd-Warshall Routing Algorithms. Cost function                                                                                                                                    | 2            |                                                                                                                                  |                                                 |
| 13. Optimal routing. Link capacity. Latency. Link flow. Round-trip delay. Cost function. Minimizing the cost function. Randomization and metering methods.                                                                                                        | 2            |                                                                                                                                  |                                                 |
| 14. Review. Examples of subjects given in the previous academic year                                                                                                                                                                                              | 2            |                                                                                                                                  |                                                 |
| <b>Bibliography:</b>                                                                                                                                                                                                                                              |              |                                                                                                                                  |                                                 |
| 1. V. Dobrota, <i>Digital Networks in Telecommunications. Volume I: Digital Switching. Traffic Analysis. Third Edition</i> . Mediamira Science Publishers, Cluj-Napoca 2002, ISBN: 973-9357-09-1 (in Romanian).                                                   |              |                                                                                                                                  |                                                 |
| 2. P. Van Mieghem, <i>Performance Analysis of Communications Networks and Systems</i> , Cambridge University Press, 2014                                                                                                                                          |              |                                                                                                                                  |                                                 |
| 3. L. Peterson, C. Cascone, B. O’Connor, T. Vachuska, B. Davie, <i>Software-Defined Networks: A Systems Approach</i> , Systems Approach LLC, 2021, Available: <a href="https://sdn.systemsapproach.org/index.html">https://sdn.systemsapproach.org/index.html</a> |              |                                                                                                                                  |                                                 |
| <b>On-line references:</b>                                                                                                                                                                                                                                        |              |                                                                                                                                  |                                                 |
| 4. V. Dobrota, <i>Switching and Routing Systems</i> . Technical University of Cluj-Napoca, 2026-2027 <a href="https://el.el.obs.utcluj.ro/scr/en_index.htm">https://el.el.obs.utcluj.ro/scr/en_index.htm</a>                                                      |              |                                                                                                                                  |                                                 |

| 9.1 Lecture                                                                                                                                                                                                                                                                                                                                                                                                                                       | No. of hours | Teaching methods | Remarks |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|---------|
| 5. D. Bertsekas, R. Gallager, Data Networks. Second Edition, Prentice-Hall Inc., USA 1992, Available: <a href="https://web.mit.edu/dimitrib/www/datanets.html">https://web.mit.edu/dimitrib/www/datanets.html</a><br>6. L. Peterson, B. Davie, Computer Networks. A Systems Approach. Sixth Edition. Systems Approach LLC, 2024, Available: <a href="https://book.systemsapproach.org/index.html">https://book.systemsapproach.org/index.html</a> |              |                  |         |

| 9.2 Laboratory                                                                                                                                                                        | No. of hours | Teaching methods                                              | Remarks                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 1. Linux Fedora Installation                                                                                                                                                          | 2            | Didactic and experimental proof, didactic exercise, team work | Use of laboratory instrumentation, experimental boards, computers, magnetic board |
| 2. Introduction to Linux. Working with files.                                                                                                                                         | 2            |                                                               |                                                                                   |
| 3. Strictly Non-Blocking Three-Stage Clos Switch. Software Package for Designing of Clos Switches                                                                                     | 2            |                                                               |                                                                                   |
| 4. Software Package for the Simulation of Rectangular Delta Switches. Software Package for the Simulation of Rectangular Omega Switches                                               | 2            |                                                               |                                                                                   |
| 5. Multiple Stage Switches with Multiple Paths (Benes). Software Package for the Simulation of Benes Switches.                                                                        | 2            |                                                               |                                                                                   |
| 6. STS Switch. Software Package for the Designing of STS Switches                                                                                                                     | 2            |                                                               |                                                                                   |
| 7. TST Switch. Software Package for the Designing of TST Switches                                                                                                                     | 2            |                                                               |                                                                                   |
| 8. Software Package for the Calculation of Binomial Bernoulli, Normal Laplace-Gauss and Poisson Distributions. Software Package for the Calculation of Erlang B and Erlang C Formulas | 2            |                                                               |                                                                                   |
| 9. Problems within Chapter 2 (Traffic Analysis)                                                                                                                                       | 2            |                                                               |                                                                                   |
| 10. Problems within Chapter 1 (Digital Switching) + Chapter 2 (Traffic Analysis)                                                                                                      | 2            |                                                               |                                                                                   |
| 11. Software Package for Bellman-Ford Algorithm                                                                                                                                       | 2            |                                                               |                                                                                   |
| 12. Software Package for Dijkstra's Algorithm                                                                                                                                         | 2            |                                                               |                                                                                   |
| 13. Floyd-Warshall Algorithm. Software Package for Floyd-Warshall Algorithm                                                                                                           | 2            |                                                               |                                                                                   |
| 14. Recovery Laboratory. Questions                                                                                                                                                    | 2            |                                                               |                                                                                   |

**On-line references:**

- V. Dobrota, Switching and Routing Systems. Technical University of Cluj-Napoca, 2026-2027  
[https://el.el.obs.utcluj.ro/scr/en\\_index.htm](https://el.el.obs.utcluj.ro/scr/en_index.htm)

| 9.3 Project                                                                                                                                                                        | No. of hours | Teaching methods                                              | Remarks                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------|------------------------------------|
| 1. Adrese IPv4                                                                                                                                                                     | 2            | Didactic and experimental proof, didactic exercise, team work | Use of laboratory instrumentation, |
| 2. IPv4 Addressing                                                                                                                                                                 | 2            |                                                               |                                    |
| 3. Create a dial plan for an AsteriskNOW IP PBX installed on a CentOS virtual machine, with at least two SIP subscribers and at least two IAX2 subscribers. The mandatory part for | 2            |                                                               |                                    |

| 9.2 Laboratory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No. of hours | Teaching methods | Remarks |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|---------|
| managing phone calls will be implemented (DIAL, RINGING, ANSWER and HANGUP functions). Implementation of two particular functions (e.g. VOICE-MAIL, CONFERENCING, SAY, PLAY, WAIT, AUTHENTICATE, TIMEOUT, RECORD).                                                                                                                                                                                                                                                                                                                                                    |              |                  |         |
| 4. Working for project: Call one SIP subscriber, one IAX subscriber                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2            |                  |         |
| 5. Working for project: Implementation of SIP functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2            |                  |         |
| 6. Working for project: Implementation of IAX2 functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2            |                  |         |
| 7. Working for project: Integrate SIP and IAX functions.<br>Optional: testing in OpenStack-based cloud                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2            |                  |         |
| <b>References:</b> <ol style="list-style-type: none"> <li>1. C. Negus, <i>Linux Bible</i>, 11th Edition, Sybex Publishers, 2025</li> <li>2. R. Blum, C. Bresnahan, <i>Linux Command Line and Shell Scripting Bible, Fifth Edition</i>, Wiley Publishers, 2025</li> </ol> <b>On-line references:</b> <ol style="list-style-type: none"> <li>3. V. Dobrota, <i>Switching and Routing Systems</i>. Technical University of Cluj-Napoca, 2026-2027<br/><a href="https://el.el.obs.utcluj.ro/scr/en_index.htm">https://el.el.obs.utcluj.ro/scr/en_index.htm</a></li> </ol> |              |                  |         |

#### 10. Alignment of the course contents with the expectations of the epistemic community, professional associations, and representative employers in the field related to the program

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The discipline content and the acquired skills are in agreement with the expectations of the professional Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant). |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 11. Assessment

| Activity type                     | 11.1 Assessment criteria                                         | 11.2 Assessment methods and type of assessment: continuous/ summative)                                                                                                     | 11.3 Weight in final grade                |
|-----------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| 11.4 Lecture                      | The level of acquired theoretical knowledge and practical skills | Theoretical Test (mark T) : 9 questions (summative)                                                                                                                        | T, max 10 pts. 50%                        |
| 11.5 Laboratory/ Project          | The level of acquired knowledge and abilities                    | Project (P1): oral and practical exam based on laboratory and project work (continuous)<br>Problem (P2) written exam to solve a problem covering all chapters (continuous) | P1, max. 5 pts. 25%<br>P2, max. 5 pts 25% |
| 11.6 Minimum performance standard |                                                                  |                                                                                                                                                                            |                                           |

### Qualitative point of view

*Minimal theoretical and practical knowledge:*

- ✓ 1. Understanding the basic concepts regarding switching and routing algorithms
- ✓ 2. Development of skills and abilities for configuring IP-based Asterisk telephone exchange

*Minimal acquired competences:*

- ✓ Ability to develop simple private branch exchange (PBX) applications
- ✓ Ability to analyze and improve performance of switching and routing systems

### Quantitative point of view

- ✓  $T \geq 5$
- ✓  $P = P1 + P2 \geq 5$ ,  $P2 \geq 1.5$

$(T+P)/2 \geq 4.5$

| Completion date: | Course coordinators | teaching rank, title First name<br>LAST NAME | Signature |
|------------------|---------------------|----------------------------------------------|-----------|
| 16.06.2026       | Lecture             | Professor Virgil DOBROTA, Ph.D.              |           |
|                  | Applications        | Professor Virgil DOBROTA, Ph.D.              |           |
|                  |                     | Assist. Prof. Andrei Bogdan RUS, Ph.D.       |           |
|                  |                     | Assist. Robert BOTEZ, Ph.D. student          |           |

Approval of the Head of the Department coordinating the course, only if this differs from the department organizing the study program

Head of Department

Date of approval by the Council of the Communications Department  
19.06.2026

Head of Communications Department  
Prof. Virgil DOBROTA, Ph.D.

Date of approval by the Council of the Faculty of Electronics, Telecommunications and Information Technology  
30.06.2026

Dean,  
Prof. Ovidiu-Aurel POP, Ph.D.