



**School: COMPUTER SCIENCE FOR BUSINESS MANAGEMENT**

**Program: Computer Science for Economics (bachelor)**

**Academic year: 2024-2025**

## TOPICS OF THE BACHELOR'S EXAM.

### DISCIPLINES ON WHICH THE BACHELOR'S EXAM IS TAKEN

#### I. EXAM 1

Exam 1 is the assessment of basic and specialized knowledge, being an examination usually written. Below is the supplementary bibliography related to the evaluation for Exam 1 of the bachelor's exam.

| GENERAL TOPICS                                                                                         | RECOMMENDED BIBLIOGRAPHY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Development of computer applications based on C language programming (C ++, C # etc.)                  | <ol style="list-style-type: none"> <li>1. Stanley B. Lippman, Josee Lajoie, Barbara E. Moo, C++ Primer, Addison-Wesley Professional Ed.</li> <li>2. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>3. Bjarne Stroustrup, The C++ Programming Language, Addison-Wesley Professional Ed.</li> <li>4. Crişan D.A., Programarea aplicaţiilor folosind limbajul C# şi platforma .NET, volumul I. Limbajul C#, Ed Prouniversitaria</li> <li>5. Andrew Troelsen, <u>Philip Japikse, C# 6.0 and the .NET 4.6 Framework</u></li> <li>6. <u>John Sharp</u>, Microsoft Visual C# Step by Step, 8th Edition, Developer Reference</li> </ol> |
| Development of computer applications based on Java programming (Java, Kotlin, Scala, JVM-generic etc). | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>2. Java The Complete Reference – ISBN: 978-1260440232 - Herbert Schildt</li> <li>3. Core Java Volume I--Fundamentals – ISBN 978-0135166307 – Cay Horstmann</li> <li>4. Core Java, Volume II--Advanced Features – ISBN 978-0135166314– Cay Horstman</li> </ol>                                                                                                                                                                                                                                                                          |



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|                                                                          | <p>5. Beginning Jakarta EE Web Development: Using JSP, JSF, MySQL, and Apache Tomcat for Building Java Web Applications – ISBN: 978-1484258651 – Luciano Mineli, Giulio Zambon</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Development of computer applications based on Python programming         | <p>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</p> <p>2. Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming – ISBN: 978-1593279288 – Eric Matthes</p> <p>3. Guide to The Python Programming Language: Start Your Engines and Code: Python Programming for The Absolute Beginner – ISBN/ASIN: B09156FK9H - Akiko Cregin</p> <p>4. Learning Python: A Crash Course to Learn Coding &amp; Programming with Python In A Week: Learn Coding From Scratch – ISBN/ASIN: B0914CZ7C4 - Tim Sukovaty</p> <p>5. How to Use MySQL, PHP and Python to Make Practical and Effective Projects – ISBN/ASIN: B09134RFD5 – Angel Johnson</p> |
| Development of computer applications based on Swift programming language | <p>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</p> <p>2. Mastering Swift 5: Deep dive into the latest edition of the Swift programming language, 5th Edition – ISBN/ASIN: B07RD3P9PY – Jon Hoffman</p> <p>3. Mastering Swift 5.3: Upgrade your knowledge and become an expert in the latest version of the Swift programming language – ISBN: 978-1800562158 – Jon Hoffman</p> <p>4. iOS 14 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics – ISBN: 978-1492092094 – Matt Neuburg</p> <p>5. iOS 14 Programming for Beginners: Get started with building iOS apps with Swift 5.3 and Xcode 12 – ISBN: 978-1800209749 – Ahmad Sahar</p>       |
| Development of computer applications based on Visual Basic programming   | <p>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</p> <p>2. Learn Visual Basic, ISBN/ASIN: B07YQ8BVPZ, Philip Conrod</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



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|                                                                                                                                          | <ol style="list-style-type: none"> <li>3. Starting Out with Visual Basic, ISBN: 978-0135204658, Tonny Gaddis, Kip Irvine</li> <li>4. Visual Basic 2019 Handbook: A Concise Guide to VB2019 Programming, ISBN/ASIN: B08PJWJWL1, Liew Voon Kiong</li> <li>5. Visual Basic .Net and Database: Practical Tutorials, ISBN/ASIN: B08MC57J86, Vivian Siahaan, Rismon Hasiholan Sianipar</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                     |
| Development of computer applications in the field of computer networks                                                                   | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>2. Computer Networking Problems and Solutions: An Innovative Approach to Building Resilient, Modern Networks, ISBN: 978-1587145049, Russ White, Ethan Banks</li> <li>3. Beej's Guide to Network Programming: Using Internet Sockets, ISBN: 978-1705309902, Brian "Beej Jorgensen" Hall</li> <li>4. Hands-On Network Programming with C# and .NET Core: Build robust network applications with C#and .NET Core, ISBN: 978-1789340761, Sean Burns</li> <li>5. Computer Networking, ISBN/ASIN: B08KF4RQ5N, James F. Kurose, Keith Ross</li> </ol>                                                                               |
| Development of IT applications based on the .Net technical infrastructure                                                                | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>2. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</li> <li>3. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1</li> <li>4. Pro C# 8 with .NET Core 3: Foundational Principles and Practices in Programming, ISBN: 978-1484257555, Andrew Troelsen, Phil Japikse</li> <li>5. Clean architecture with programming in Dot net Programming: Learn by simulation and Dot net Programming practice with experts Learn code by doing, ISBN/ASIN: B08Z8H49FW, Ken Lonsdale</li> </ol> |
| Development of IT applications based on the technical infrastructure with other SQL databases (MariaDB, PostgreSQL, IBM Db2, Hive, etc.) | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



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|                                                                                                                                                 | <ol style="list-style-type: none"> <li>2. Tratat baze de date, vol. II, Sisteme de gestiune a bazelor de date, ASE, București</li> <li>3. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</li> <li>4. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1</li> <li>5. Learn SQL Database Programming: Query and manipulate databases from popular relational database servers using SQL, ISBN: 978-1838984762, Josephine Bush</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Development of computer applications based on the technical infrastructure with Microsoft databases (MS Access, SQL Server, etc.)               | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>2. Alexander M., Kusleika R. – <i>Access 2016 Bible</i>, Wiley</li> <li>3. Tratat baze de date, vol. II, Sisteme de gestiune a bazelor de date, Ion Lungu, ASE, București</li> <li>4. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</li> <li>5. Finnegan K.T., Oja D., Vodnik S., Shellman M. – <i>New Perspectives Microsoft Office 365 &amp; Access 2016: Comprehensive</i>, Cengage Learning</li> <li>6. Pierce J. – <i>Exam 77-730 – MOS 2016 Study Guide for Microsoft Access</i>, Microsoft Press</li> <li>7. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1</li> <li>8. SQL Server Database Programming with Visual Basic.NET: Concepts, Designs and Implementations, ISBN: 978-1119608509, Ying Bai</li> </ol> |
| Development of IT applications based on the technical infrastructure with non-SQL databases (MongoDB, Redis, DynamoDB, CouchDB, CosmosDB, etc.) | <ol style="list-style-type: none"> <li>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</li> <li>2. Tratat baze de date, vol. II, Sisteme de gestiune a bazelor de date, ASE, București</li> <li>3. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</li> <li>4. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



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|                                                                                                                                  | <p>5. Learn MongoDB 4.x: A guide to understanding MongoDB development and administration for NoSQL developers, ISBN: 978-1789619386, Doug Bierer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Development of computer applications based on the technical infrastructure with Oracle databases                                 | <p>1. Tratat baze de date, vol. II, Sisteme de gestiune a bazelor de date, Ion Lungu, ASE, București</p> <p>2. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</p> <p>3. Dennis Alan, Systems Analysis and Design, 7th Edition, Wiley, ISBN-13 978-1119496502</p> <p>4. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1</p> <p>5. Understanding Oracle APEX 20 Application Development: Think Like an Application Express Developer, ISBN: 978-1484261644, Edward Sciore</p> <p>6. Kim Berg Hansen, Practical Oracle SQL - Mastering the Full Power of Oracle Database, Apress, ISBN 978-1-4842-5617-6</p> |
| Development of IT applications based on the PHP / MySQL technical infrastructure (specific standards and / or frameworks)        | <p>1. Manualul tau de PHP – ISBN 978-973-750-282-8 – Traian Anghel</p> <p>2. MySQL Cookbook: Solutions for Database Developers and Administrators – ISBN: 978-1449374020 – Paul DuBois</p> <p>3. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</p> <p>4. Learning PHP, MySQL &amp; JavaScript: With jQuery, CSS &amp; HTML5, ISBN: 978-1491978917, Robin Nixon</p> <p>5. Beginning PHP and MySQL: From Novice to Professional – ISBN: 978-1430260431 – Frank M. Kromann</p>                                                                                                                                                                                                             |
| Development of web applications based on JavaScript infrastructure (front-end / back-end, standard and / or specific frameworks) | <p>1. Cretan Adina, Analiza si proiectarea sistemelor informatice, ISBN: 978-606-647-799-4, Editura Pro Universitaria</p> <p>2. Tratat baze de date, vol. II, Sisteme de gestiune a bazelor de date, Ion Lungu, ASE, București</p> <p>3. Botezatu M.A, G Carutasu, Botezatu C, Managementul proiectelor informatice, Editura ProUniversitaria, București</p> <p>4. New Perspectives HTML5 and CSS3: Comprehensive – ISBN 978-1305503939 – Patrick M. Carey</p>                                                                                                                                                                                                                                                                                            |



5. Web Programming with HTML5, CSS, and JavaScript – ISBN 978-1284091793 – John Dean
6. Kenneth E. Kendall, Julie E Kendall, Systems Analysis and Design, 10th Edition, Publisher: Pearson, ISBN 13: 978-0-13-481736-1
7. HTML5, CSS, and JavaScript: Learn the Basics of HTML5, JavaScript, & CSS with Practical Exercises of Computer Programming Languages – ISBN 978-1694550262 – Brandon Cooper

**ATTENTION:**

For all titles above please check the latest edition available.

The supplementary bibliography completes the bibliographic materials from the subject sheets of the subjects studied during the undergraduate educational route, consistent with the technologies used for the elaboration of the practical application / case study within the undergraduate thesis.



## II. EXAM 2

Exam 2 of the bachelor's exam represents the oral presentation of the paper as a whole, including the mandatory software application developed by the graduate.

The bachelor's thesis must be in line with one of the general topics above (see [I. EXAM 1](#)).

Below we present an exhaustive list of individualized topics, from which students can choose a variant for the elaboration of the bachelor's thesis and the compulsory software application:

### LIST OF POSSIBLE TOPICS FOR THE BACHELOR PROJECT

- 1 STOCK MARKET ACTIVITY. MODELS USED IN PORTFOLIO MANAGEMENT
- 2 SOFTWARE APPLICATIONS FOR THE SUPPLY CHAIN MANAGEMENT
- 3 SOFTWARE APPLICATIONS FOR THE MANAGEMENT OF HEALTH UNITS
- 4 SOFTWARE APPLICATIONS FOR THE HUMAN RESOURCE MANAGEMENT
- 5 APPLICATION FOR THE RECORD OF BANK LOANS IN A COMMERCIAL BANK
- 6 APPLICATIONS FOR THE DOMESTIC AND INTERNATIONAL BANKING LENDING OPERATIONS
- 7 CLIENT-SERVER APPLICATION FOR STOCKS
- 8 INTERNET / INTRANET APPLICATION FOR FINANCIAL ACCOUNTING
- 9 APPLICATION FOR THE MANAGEMENT OF A LOCAL NETWORK IMPLEMENTED IN A MULTINATIONAL COMPANY
- 10 WEB APPLICATION DEVELOPED IN PHP AND MY-SQL
- 11 WEB APPLICATION DEVELOPED WITH ORACLE PRODUCTS 10G (DISCOVERER/ DEVELOPER)
- 12 TELEMARKETING WEB APPLICATION
- 13 SOFTWARE APPLICATION FOR MONITORING A COMPUTER NETWORK
- 14 ON-LINE APPLICATION IMPLEMENTED FOR ELECTRONIC PUBLISHING
- 15 ON-LINE APPLICATION FOR THE MANAGEMENT OF BOOKS AND READERS OF A LIBRARY
- 16 ON-LINE APPLICATION FOR TICKET RESERVATION AND SALE, SERVING A TRANSPORT COMPANY
- 17 SOFTWARE APPLICATION FOR GENERATING THE TIMETABLE OF UNIVERSITY SCHOOLS
- 18 APPLICATION FOR ASSISTING LENDING DECISIONS IN A COMMERCIAL BANK AND ESTABLISHING BANKING ARREARS
- 19 SOFTWARE APPLICATION FOR THE INSURANCE OF GOODS SERVING AN INSURANCE AGENCY
- 20 SOFTWARE APPLICATION FOR THE OPENING AND FOLLOWING-UP OF BANK DEPOSITS
- 21 APPLICATION FOR THE DATA MANAGEMENT OF LIBRARIES
- 22 APPLICATION FOR THE MANAGEMENT OF MEDICAL CERTIFICATES
- 23 COMPUTER APPLICATIONS FOR SALES IN AUTOMOTIVE INDUSTRY
- 24 PROVIDING INFORMATION SECURITY IN COMPUTER NETWORKS
- 25 ONLINE DATABASES FOR PROMOTING GEOGRAPHICAL REGIONS
- 26 DATABASE FOR THE MANAGEMENT OF IMPORT-EXPORT ACTIVITIES SERVING A TRANSPORT COMPANY
- 27 DATABASE FOR FOLLOWING-UP THE OPERATIONS OF FOREIGN TRADE
- 28 DATABASE TRACK OF A HOSPITAL / POLYCLINIC
- 29 DATABASE FOR THE ONLINE BOOKING AND MANAGEMENT OF SALES
- 30 SYSTEM FOR BOOKING TICKETS SERVING A RAILWAY / ROAD COMPANY
- 31 INFORMATION KIOSK FOR STUDENTS



**ATTENTIN:**

- a. **It is NOT mandatory to choose a theme from the list above.**
- b. The topics proposed for the bachelor's thesis are addressed to students in 2<sup>nd</sup> / 3<sup>rd</sup> year.
- c. Students may propose other topics, provided that the topic is accepted by a scientific coordinator.
- d. The theme agreed by the student and coordinator DOES NOT REPRESENT THE TITLE OF THE WORK, which must be customized with elements specific to each bachelor's thesis.

*Example:*      Topic: „DEVELOPING A NETWORK GAME USING PHP MYSQL TECHNOLOGIES”

                    Title: „DEVELOPMENT OF THE WEB VIDEO GAME *PANDEMIC HUNT*”