**Tematica și bibliografia pentru**

**Admitere (interviu) la programul de master**

***Informatică aplicată în științe, tehnologie și economie***

 **Septembrie 2022**

1. **STRUCTURI DE DATE, ALGORITMI ŞI PROGRAMARE**
	1. Algoritmi elementari. Eficienţa algoritmilor.
	2. Programare orientată obiect. Obiecte şi clase. Polimorfism, mostenire.
	3. Tablouri (unidimensionale, bidimensionale, multidimensionale).
	4. Alocare dinamica de memorie. Structuri implementate dinamic (stiva, coada, lista simplu inlantuita, lista dublu 1nlantuita).
	5. Analiza complexitatii algoritmilor.
	6. .net framework.
	7. Utilizarea Java în context visual.

**Bibliografie**

1. [Thomas H. Cormen](https://www.amazon.com/Thomas-H-Cormen/e/B000AQ24AS/ref%3Ddp_byline_cont_book_1), [Charles E. Leiserson](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Charles+E.+Leiserson&text=Charles+E.+Leiserson&sort=relevancerank&search-alias=books), [Ronald L. Rivest](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_3?ie=UTF8&field-author=Ronald+L.+Rivest&text=Ronald+L.+Rivest&sort=relevancerank&search-alias=books), [Clifford Stein](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_4?ie=UTF8&field-author=Clifford+Stein&text=Clifford+Stein&sort=relevancerank&search-alias=books), Introduction to Algorithms, fourth edition 4th Edition, Publisher ‏ : ‎ The MIT Press; 4th edition (April 5, 2022),
2. [Andrew Troelsen](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Andrew+Troelsen&text=Andrew+Troelsen&sort=relevancerank&search-alias=books) (Author), [Philip Japikse](https://www.amazon.com/Philip-Japikse/e/B019HFNCTO/ref%3Ddp_byline_cont_book_2), Pro C# 10 with .NET 6: Foundational Principles and Practices in Programming 11st ed. Edition, Publisher: ‎ Apress; 11st ed. edition (October 10, 2022),
3. [John Sharp](https://www.amazon.com/John-Sharp/e/B001IGOCMM/ref%3Ddp_byline_cont_book_1), Microsoft Visual C# Step by Step (Developer Reference) 10th Edition, Publisher ‏ : ‎ Microsoft Press; 10th edition (April 13, 2022),
4. [Bjarne Stroustrup,](https://www.amazon.com/Bjarne-Stroustrup/e/B000AQ349S/ref%3Ddp_byline_cont_book_1) A Tour of C++ (2nd Edition) (C++ In-Depth Series) 2nd Edition, Publisher: Addison-Wesley Professional; 2 edition (July 9, 2018),
5. [Michael B. White,](https://www.amazon.com/Michael-B-White/e/B07MJR9H4P/ref%3Ddp_byline_cont_book_1) Mastering Java: An Effective Project Based Approach including Web Development, Data Structures, GUI Programming and Object Oriented Programming (Beginner to Advanced), Publisher: Independently published (December 13, 2018),
6. [Herbert Schildt,](https://www.amazon.com/Herbert-Schildt/e/B001H6PSMG/ref%3Ddp_byline_cont_book_1) Java: The Complete Reference, Eleventh Edition 11th Edition, Publisher: McGraw-Hill Education; 11 edition (December 12, 2018),
7. [Herbert Schildt,](https://www.amazon.com/Herbert-Schildt/e/B001H6PSMG/ref%3Ddp_byline_cont_book_1) Java: A Beginner's Guide, Eighth Edition 8th Edition, Publisher: McGraw-Hill Education; 8 edition (November 2, 2018),
8. [Joshua Bloch,](https://www.amazon.com/Joshua-Bloch/e/B001CDCVUG/ref%3Ddp_byline_cont_book_1) Effective Java 3rd Edition, Publisher: Addison-Wesley Professional; 3 edition (January 6, 2018),
9. [Daniel Solis,](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_1?ie=UTF8&field-author=Daniel+Solis&text=Daniel+Solis&sort=relevancerank&search-alias=digital-text) [Cal Schrotenboer,](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_2?ie=UTF8&field-author=Cal+Schrotenboer&text=Cal+Schrotenboer&sort=relevancerank&search-alias=digital-text) Illustrated C# 7: The C# Language Presented Clearly, Concisely, and Visually 5th Edition, Publisher: Apress; 5 edition (February 19, 2018),
10. [John Sharp,](https://www.amazon.com/John-Sharp/e/B001IGOCMM/ref%3Ddp_byline_cont_book_1) Microsoft Visual C# Step by Step (9th Edition) (Developer Reference) 9th Edition, Publisher: Microsoft Press; 9 edition (July 5, 2018),
11. [Ryan Turner,](https://www.amazon.com/Ryan-Turner/e/B07K9G749K/ref%3Ddp_byline_cont_ebooks_1) C#: The Ultimate Beginner's Guide to Learn C# Programming Step by Step, Publication Date: March 7, 2019,
12. [Christian Nagel,](https://www.amazon.com/Christian-Nagel/e/B001HD1WLA/ref%3Ddp_byline_cont_book_1) Professional C# 7 and .NET Core 2.0, Publisher: Wrox; 7 edition (April 17, 2018).
13. **BAZE DE DATE ŞI TEHNOLOGII WEB**
	1. Baze de date relaţionale. Istoric. Clasificare. Forme normale.
	2. Crearea si interogarea bazelor de date folosind un limbaj de nivel inalt. Elemente de programare VBA.
	3. Crearea si interogarea bazelor de date relationale folosind SQL.
	4. Principalele tehnologii pentru realizarea paginilor web.
	5. Limbajul HTML. Utilizarea JavaScript
	6. Baze de date MySql. Elemente de programare php.

**Bibliografie**

1. [Elvis Foster](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Elvis+Foster&text=Elvis+Foster&sort=relevancerank&search-alias=books), [Shripad Godbole](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Shripad+Godbole&text=Shripad+Godbole&sort=relevancerank&search-alias=books), Database Systems: A Pragmatic Approach 3rd Edition, Publisher ‏ : ‎ Auerbach Pub; 3rd edition (July 6, 2022),
2. [Carlos Coronel](https://www.amazon.com/Carlos-Coronel/e/B001H6NK6M/ref%3Ddp_byline_cont_ebooks_1)  (Author), [Steven Morris](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_2?ie=UTF8&field-author=Steven+Morris&text=Steven+Morris&sort=relevancerank&search-alias=digital-text) (Author), Database Systems: Design, Implementation, & Management 13th Edition, Cengage Learning; 013 edition (January 1, 2018),
3. [Josephine Bush](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_1?ie=UTF8&field-author=Josephine+Bush&text=Josephine+Bush&sort=relevancerank&search-alias=digital-text) (Author), Learn SQL Database Programming: Query and manipulate databases from popular relational database servers using SQL, Packt Publishing (June 9, 2020),
4. Dollinger R., Baze de date şi gestiunea tranzacţiilor, Ed. Albastră, Cluj-Napoca,1998, reeditată 2002,
5. Nagy M., Vizental M., Baze de date. Material de studiu pentru învăţământul la distanţă., UAV, 2010,
6. Vaswani V., Utilizarea şi administrarea bazelor de date MySQL., Editura Rosetti Educational, Bucureşti, 2010.
7. **CRIPTOGRAFIE ŞI SECURITATEA INFORMAŢIEI**
	1. Criptologia. Criptografia clasică. Criptografia modernă. Criptalnaliza.
	2. Bazele matematice al criptografiei. Algoritmi simetrici. Algoritmi asimetrici
	3. Metode pentru asigurarea securităţii informaţiei.

3.4 Semnătura electronică.

**Bibliografie**

1. [Simon Edwards](https://www.amazon.com/Simon-Edwards/e/B0034NDL4C/ref%3Ddp_byline_cont_ebooks_1) , Modern Cryptography for Beginners: A Complete Guide to Discover History, Features, Developments and Applications of Modern Cryptography, March 6, 2020.
2. Bart Preneel (Foreword), Christof Paar (19-Oct-2011) Hardcover, Understanding Cryptography: A Textbook for Students and Practitioners, Springer; 1st ed. 2010 edition (19 Oct. 2011) (1600)
3. [Jean-Philippe Aumasson,](https://www.amazon.com/Jean-Philippe-Aumasson/e/B071HQLPFS/ref%3Ddp_byline_cont_ebooks_1) Serious Cryptography: A Practical Introduction to Modern Encryption , No Starch Press (November 21, 2017)
4. [Simon Singh,](https://www.amazon.com/Simon-Singh/e/B000APSATI/ref%3Ddp_byline_cont_ebooks_1) The Code Book: The Science of Secrecy from Ancient Egypt to Quantum Cryptography , Anchor; Reprint edition (January 26, 2011)
5. [Seth James Nielson](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_1?ie=UTF8&field-author=Seth+James+Nielson&text=Seth+James+Nielson&sort=relevancerank&search-alias=digital-text) (Author), [Christopher K. Monson](https://www.amazon.com/s/ref%3Ddp_byline_sr_ebooks_2?ie=UTF8&field-author=Christopher+K.+Monson&text=Christopher+K.+Monson&sort=relevancerank&search-alias=digital-text) (Author) , Practical Cryptography in Python: Learning Correct Cryptography by Example, Apress; 1st ed. edition (September 27, 2019) . 6. Bucerzan D., Criptografie şi securitatea informaţiei. Note de curs., Arad, 2011

7. Oprea D., Protectia si securitatea informatiilor, ed Polirom, Iasi, 2007.

1. **INTELIGENTA ARTIFICIALA**
	1. Obiectul şi domeniile inteligenţei artificiale.
	2. Sisteme informatice bazate pe cunoştinţe.
	3. Elemente de logica Fuzzy.
	4. Proprietati matematice si reprezentarea retelelor Bayesian.
	5. Cauzalitate si inferenta.
	6. Algoritmi de inferenta si pachete soft dedicate- Netica.

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1. [Peter Norvig](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Peter+Norvig&text=Peter+Norvig&sort=relevancerank&search-alias=books) (Author), [Stuart Russell](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Stuart+Russell&text=Stuart+Russell&sort=relevancerank&search-alias=books) (Author), Artificial Intelligence: A Modern Approach, Global Edition 4th Edition, Publisher ‏ : ‎ Pearson; 4th edition (May 13, 2021).
2. Dzitac I., Inteligenta artificială, Ed. Univ. ,,Aurel Vlaicu" Arad, 2008.
3. Joseph C. Giarratano, Gary D. Riley,Expert Systems: Principles and Programming, Course Technology; 4 edition (October 15, 2004).
4. [https://www.norsys.com/netica.html.](https://www.norsys.com/netica.html)
5. [Therese M. Donovan,](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Therese+M.+Donovan&text=Therese+M.+Donovan&sort=relevancerank&search-alias=books) [Ruth M. Mickey](https://www.amazon.com/s/ref%3Ddp_byline_sr_book_2?ie=UTF8&field-author=Ruth+M.+Mickey&text=Ruth+M.+Mickey&sort=relevancerank&search-alias=books) - Bayesian Statistics for Beginners: a step-by-step approach, Oxford University Press (July 23, 2019).
6. William Siler, James J. Buckley, Fuzzy Expert Systems and Fuzzy Reasoning, Wiley Interscience; I edition (December 13, 2004).
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8. S.J. Russel, P. Norvig, Artificial Intelligence: A Modern Approach, Third Edition, 2013.
9. Dzitac, I.; Bărbat, B. Artificial Intelligence + Distributed Systems = Agents , International Journal of Computers Communications & Control, ISSN 1841-9836, 4(1):17-26, 2009.
10. Russel, S.J.; Norvig, P. Artificial Intelligence: A Modern Approach, Modified May 26,

2016.<http://aima.cs.berkeley.edu/>

1. **DEZVOLTAREA APLICATIILOR ANDROID**

5.1 Sisteme de operare pentru platforme mobile.

5.2 Proiectarea aplicatiilor mobile.

5.3 Elemente de interfata pentru aplicatii mobile.

5.4 Activitati. Intentii. Meniuri. Elemente grafice si audio.

5.5 Procese, Thread-ur si curs de executie.

5.6 Evenimente.

5.7 Stocarea fisierelor si elemente SQLite.

**Bibilografie**

1. Rob Whitaker, Developing Inclusive Mobile Apps: Building Accessible Apps for iOS and Android, Apress, ISBN-13:9781484258132, 2020
2. Kishan Takoordyal, Beginning Unity Android Game Development: From Beginner to Pro, Apress, ISBN-13: 9781484260012,2020
3. Ian Darwin, Android Cookbook, 2e, O'Reilly, ISBN-13: 9781449374433, 2017
4. Octavian Dospinescu, Marian Perca, Aplicatii mobile pe platforma android, Editura Tehnopress, ISBN: 9789737029614, 2013
5. COSMIN STRILETCHI, LIGIA D. CHIOREAN, MIRCEA F. VAIDA, ADRIANA STAN, STEFAN DRAGOS, Tehnologii Javaorientate spre aplicatii cross-platform, Casa Cartii de Stiinta, ISBN:9786061716104, 2020