**INTERVIEW TOPICS FOR ADMISSION**

**September 2022 session**

**Study program:**

**ADVANCED STUDIES IN APPLIED COMPUTER SCIENCE**

**(master)**

1. **DATA STRUCTURES, ALGORITHMS AND PROGRAMMING**
   1. Fundamental algorithms. Efficiency of algorithms.
   2. Object Oriented Programming. Objects and Classes. Polymorphism, Inheritance.
   3. Arrays (one-dimensional, two-dimensional, multidimensional).
   4. Dynamic memory allocation. Dynamically implemented structures (stack, queue, single chained list, double chained list).
   5. Algorithms complexity.
   6. .net framework.
   7. Using Java in visual context.

**References**

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2. [Andrew Troelsen](https://www.amazon.com/s/ref=dp_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=dp_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=dp_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=dp_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),
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6. [Herbert Schildt,](https://www.amazon.com/Herbert-Schildt/e/B001H6PSMG/ref=dp_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=dp_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=dp_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=dp_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=dp_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=dp_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=dp_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=dp_byline_cont_book_1) Professional C# 7 and .NET Core 2.0, Publisher: Wrox; 7 edition (April 17, 2018).

1. **DATABASES AND WEB TECHNOLOGIES**
   1. Relational databases. History. Classification. Normal forms.
   2. Creating and querying databases using a high level language. VBA programming elements.
   3. Creating and querying relational databases using SQL
   4. The main technologies for web programming
   5. HTML language. JavaScript
   6. MySql databases. Php programming elements.

**References**

1. [Elvis Foster](https://www.amazon.com/s/ref=dp_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=dp_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=dp_byline_cont_ebooks_1)  (Author), [Steven Morris](https://www.amazon.com/s/ref=dp_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),
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6. Vaswani V., Utilizarea şi administrarea bazelor de date MySQL., Editura Rosetti Educational, Bucureşti, 2010.
7. **CRYPTOGRAPHY AND INFORMATION SECURITY**
   1. Cryptology. Classical cryptography. Modern cryptography. Cryptanalysis.
   2. The mathematical basics of cryptography. Symmetric algorithms. Asymmetric algorithms.
   3. Methods for ensuring information security.

3.4 Electronic signature.

**References**

1. [Simon Edwards](https://www.amazon.com/Simon-Edwards/e/B0034NDL4C/ref=dp_byline_cont_ebooks_1) , Modern Cryptography for Beginners: A Complete Guide to Discover History, Features, Developments and Applications of Modern Cryptography, March 6, 2020.
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5. [Seth James Nielson](https://www.amazon.com/s/ref=dp_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=dp_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) .
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7. Oprea D., Protectia si securitatea informatiilor, ed Polirom, Iasi, 2007.

1. **ARTIFICIAL INTELLIGENCE**
   1. The object and fields of artificial intelligence.
   2. Knowledge - based computer systems.
   3. Fuzzy logic elements.
   4. Mathematical properties and representation of Bayesian networks.
   5. Causality and inference.
   6. Inference algorithms and dedicated software packages - Netica.

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5. [Therese M. Donovan,](https://www.amazon.com/s/ref=dp_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=dp_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).
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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**
   1. Operating systems for mobile platforms.
   2. Mobile application design.
   3. Interface elements for mobile applications.
   4. Activities. Intents. Menus. Graphic and audio elements.
   5. Processes, Threads and course of execution.
   6. Events.
   7. Storing files and SQLite elements.

**References**

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,
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4. Octavian Dospinescu, Marian Perca, Aplicatii mobile pe platforma android, Editura Tehnopress, ISBN: 9789737029614, 2013,
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