SYLLABUS

for Comprehensive State Exam

Degree: Computer science

Professional qualification: Master degree in

"Informatics and Computer Science", Class: 2025 – 2026

Digital Commerce

1. Impact of the Internet on business. Internet economy. E-business definition and major advantages. E-business categories.
2. Electronic commerce – definition, features and technological models. Electronic payment systems, used in e-commerce. Evaluation of electronic shops
3. E-commerce systems. Architecture of e-commerce systems. Technologies for creating online stores. Open-source software for creating online stores.
4. Introduction to e-marketing. The e-commerce website as a marketing tool. Website promotion and advertising. Web site Search Engine Optimization (SEO).

Literature:

Laudon, K., Traver, C. (2022) E-Commerce 2022: Business, Technology, Society, Pearson, 17 edition.

Sulova, S. et. al. (2015). Electronic Business 1st Part. Business Modeling. Analysis and Development of Business Information Systems, Publishing house „Science and Economics" University of Economics – Varna, ISBN 978-954-21-0865-8.

.NET Web Development

5. The .NET platform – .NET Framework, .NET and .NET Core web applications, basic components of the .NET Framework, programming languages and development tools.
6. Web controls, events and interactions.
7. State management – application state, session state, server controls state.
8. .NET web applications security, authentication and authorization.
9. Working with databases – basic concepts and supported technologies, controls and functions for database access.

Literature:

Penberthy, W. (2015) Beginning ASP.NET for Visual Studio 2015: Web Forms and MVC. Wrox, 2015.

Chowdhury, K. (2019). Mastering Visual Studio 2019: Become proficient in .NET Framework and .NET Core by using advanced coding techniques in Visual Studio. Packt Publishing.

Online lectures (http://users.ue-varna.bg/vsulov and http://e-learn.ue-varna.bg).

E-Finance

10. Electronic banking. The essence of electronic banking. Types of electronic banking and chronology in its offering
11. Internet banking. Technology and organization of Internet banking. Types of systems for Internet banking. Advantages of Internet banking
12. Security and protection of Internet banking. Potential threats for Internet banking users. Methods for protection and authentication of users
13. Online insurance. Nature and purpose of online insurance. Peculiarities of insurance business that complicate online insurance. E-business models for Internet distribution of insurance products.
14. Electronic payment systems. Essence of electronic payment systems. Types of electronic payment systems and related payment instruments. Mobile payments

Literature:

Joshi, V. (2020). Digital Finance, Bits and Bytes: The Road Ahead. Springer Nature.

Laudon, K., Traver, C. (2022) E-Commerce 2022: Business, Technology, Society, Pearson, 17 edition.

Parusheva, S., Nestorov, K., Marinova, O. Electronic Business 2nd Part. Software Development Management. Science and Economics, University of Economics – Varna, 2015.

Wewege, L., Thomsett, M. (2019). The Digital Banking Revolution. How Fintech Companies Are Transforming the Retail Banking Industry Through Disruptive Financial Innovation. Boston/Berlin: De Gruyter.

Server-Side Web Programming

15. The client-server concept. RFC standards for communication protocols. HyperText Transfer Protocol.
16. Web server. Configuration. CGI scripts.
17. Applications with web interface. PHP. Working with templates in PHP.
18. Web applications working with DBMS. Administration tasks.
19. AJAX technology. Web application security.

Literature:

Duckett J. (2021). PHP & MySQL: Server-side Web Development. Wiley.

Tatroe, K., & MacIntyre, P. (2020). Programming PHP: Creating Dynamic Web Pages. O'Reilly Media.

Welling, L., & Thomson, L. (2016). PHP and MySQL Web Development (Developer's Library). Addison-Wesley Professional.

Data Science

20. Data Science - scope, fields, tasks.
21. Business intelligence systems. Software for building business intelligence applications.
22. Machine learning - areas, methods.
23. Team Data Science Lifecycle Process.
24. Data visualization tools

Literature:

Jo, T. Machine Learning Foundations, Supervised, Unsupervised and Advanced Learning, Springer, 2021 ISBN 9783030658991

Lachev, T. Applied Microsoft Power BI, Prologika Press, 2022, ISBN 9781733046138

Database fundamentals

25. *Basic operations with MySQL DBMS on XAMPP server.*
26. *Structured Query Language (SQL).*
27. *Data integrity. Mechanisms to ensure data integrity.*
28. *Export and import data in MYSQL.*

Literature:

Gillenson, M. Fundamentals of Database Management Systems, John Wiley & Sons, 2023

Smirnova, S., Tezuysal, A. MySQL Cookbook, O'Reilly Media, 2022

Computer networks

29. *Basic concepts of computer networks.*
30. *Netowork protocols and communication.*
31. *IPV4 and IPV6 addressing.*
32. *The OSI model.*
33. *Planning and cabeling computer networks.*

Literature:

Kurose, J., Ross, K., Computer Networking A Top-Down Approach, 8th Edition, Pearson, 2022.

Cisco Networking Academy, Introduction to Networks Companion Guide (CCNAv7), Pearson, 2020.

Type of exam: An electronic test comprising both closed and open-ended questions. The questions cover all disciplines included in the syllabus. The weight of the closed questions in determining the total score is 70% (a maximum of 70 points from closed questions). The weight of the open-ended questions is 30% (a maximum of 30 points from open-ended questions). There are 60 closed questions, each with a different weight; some have a single correct answer, while others require multiple correct answers. There are 15 open-ended questions, also with varying weights. Time allowed: 3 hours.

16.03.2026 Head of the Department of Informatics:

(Prof. Julian Vasilev, PhD)