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**Establishing Modern Master-level Studies in Information Systems
561592-EPP-1-2015-1- FR-EPPKA2-CBHE-JP**

**WP2**

**Curriculum development**

**(ІT – infrastructure)**

**Tabl. 1**

**List of Competences**

|  |  |
| --- | --- |
| **Competences****Area** | **Competences** |
| Systems Development and Deployment | 1. Managing plan-based, hybrid, and agile development approaches
 |
| 1. Specifying and documenting systems requirements
 |
| 1. Managing IS development projects
 |
| Data, Information and Content Management | 1. Selecting appropriate data management technologies based on the needs of the domain
 |
| 1. Integrating and preparing data captured from various sources for analytical use
 |
| 1. Selecting and using appropriate analytics methods
 |
| Innovation, Organizational Change and Entrepreneurship | 1. Developing a business plan
 |
| 1. Understanding how to apply creative problem solving to technology-related issues
 |
| IS Strategy and Governance | 1. Engaging in IS strategic planning
 |
| 1. Planning and implementing IS governance
 |
| Enterprise Architecture | 1. Understanding enterprise architecture principles and the value it provides to business
 |
| 1. Communicating and deploying an EA
 |
| Business Continuity and Information Assurance | 1. Implementing and managing quality audit processes
 |
| 1. Managing Information Systems risks
 |
| IS Management and Operations | 1. Managing IS/IT projects and programs
 |
| IT Infrastructure | 1. Monitoring emerging technologies to understand their potential to support the domain
 |

**Tabl. 2**

**List of Programme learning Outcomes**

|  |  |  |
| --- | --- | --- |
| № | **Professional Learning Outcomes** | **P** |
|  | to understand essential concepts, facts, principles, and theories of information system | P1 |
|  | to understand the diversity and state-of-the-art in area of information system | P2 |
|  | to be able to analyse, model, and evaluate organization's business processes from the perspective of information systems development  | P3 |
|  | to be able to apply various methods of information systems analysis | P4 |
|  | to understand problems of users of information systems, to be able to identify, analyse and specify user requirements  | P5 |
|  | to be able to manage information systems development projects and identify, analyse, evaluate, and solve the arising management problems  | P6 |
|  | to be able to identify, analyse, and understand unorthodox problems of information systems development | P7 |
|  | to be able to apply various methods of information systems design | P8 |
|  | to be able to apply methods of knowledge, metadata analysis and information safety engineering | P9 |
|  | to be able to identify, find and evaluate information relevant to information systems by using data bases and other sources of information | P10 |
|  | to be able to apply various computerized tools for model driven information systems analysis and design | P11 |
|  | to be able to choose and apply various technologies of information systems' development | P12 |
|  | to be able to apply various tools for management of information systems projects | P13 |
|  | to be able to develop innovative decisions for IT business creation and support | P14 |
| **Personal and Social Learning Outcomes** |
|  | to be able to think systematically when analysing different situations, solving problems and tasks | PS1 |
|  | to be able to apply the acquired knowledge creatively | PS2 |
|  | to be able to work individually with minimum guidance, manage one’s work and time | PS3 |
|  | to be able to work efficiently in a group, manage the team, and act collectively | PS4 |
|  | to be able to understand the impact of information systems solutions on the society and environment and their economic aspects | PS5 |

**Tabl.3**

**Correlation matrix of Competences and Programme learning Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Competencies/****Learning Outcomes** | **P1** | **P2** | **P3** | **P4** | **P5** | **P6** | **P7** | **P8** | **P9** | **P10** | **P11** | **P12** | **P13** | **P14** | **PS1** | **PS2** | **PS3** | **PS4** | **PS5** |
| 1. Managing plan-based, hybrid, and agile development approaches
 | x | X |  |  |  |  |  | x |  | x | x | x | x | x | x | x | x | x | x |
| 1. Specifying and documenting systems requirements
 | x | x |  |  | x |  |  |  |  | x |  |  |  |  | x | x | x | x | x |
| 1. Managing IS development projects
 |  |  |  |  | x |  |  | x |  | x | x | x | x |  | x | x | x | x | x |
| 1. Selecting appropriate data management technologies based on the needs of the domain
 | x | x |  |  |  |  |  |  | x | x | x | x |  |  | x | x | x | x | x |
| 1. Integrating and preparing data captured from various sources for analytical use
 | x | x |  |  |  |  |  |  | x | x | x | x |  |  | x | x | x | x | x |
| 1. Selecting and using appropriate analytics methods
 | x | x | x |  |  |  | x |  | x | x | x |  |  |  | x | x | x | x | x |
| 1. Developing a business plan
 | x | x |  |  |  |  | x |  |  | x | x |  |  | x | x | x | x | x | x |
| 1. Understanding how to apply creative problem solving to technology-related issues
 | x | x |  |  |  |  | x |  |  | x | x |  |  | x | x | x | x | x | x |
| **Competencies/****Learning Outcomes** | **P1** | **P2** | **P3** | **P4** | **P5** | **P6** | **P7** | **P8** | **P9** | **P10** | **P11** | **P12** | **P13** | **P14** | **PS1** | **PS2** | **PS3** | **PS4** | **PS5** |
| 1. Engaging in IS strategic planning
 | x | x | x |  |  | x |  |  |  | x | x |  |  | x | x | x | x | x | x |
| 1. Planning and implementing IS governance
 | x | x |  |  |  | x |  |  |  | x | x |  | x | x | x | x | x | x | x |
| 1. Understanding enterprise architecture principles and the value it provides to business
 | x |  | x | x |  |  |  |  |  | x |  |  |  |  | x | x | x | x | x |
| 1. Communicating and deploying an EA
 | x |  | x |  |  |  |  |  |  | x | x |  |  |  | x | x | x | x | x |
| 1. Implementing and managing quality audit processes
 | x |  | x | x |  |  | x |  | x | x |  |  |  |  | x | x | x | x | x |
| 1. Managing Information Systems risks
 | x |  | x | x |  | x | x |  | x | x | x |  |  |  | x | x | x | x | x |
| 1. Managing IS/IT projects and programs
 | x |  |  |  | x | x |  |  |  | x | x | x | x |  | x | x | x | x | x |
| 1. Monitoring emerging technologies to understand their potential to support the domain
 | x |  |  | x |  |  | x |  |  | x |  |  |  |  | x | x | x | x | x |

**Tabl.4**

**Correlation matrix of Programme Learning Outcomes and Courses**

|  |  |
| --- | --- |
| **Programme Learning Outcomes** | **Courses** |
| **IS Development and Deployment** | **Data Bases and Data Warehouses** | **Enterprise Architecture Management** | **Management of IS Projects** | **Enterprise Architecture Management** | **IS Strategy**  | **IT Infrastructure** |  **Innovations and Entrepreneurship** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| to understand essential concepts, facts, principles, and theories of information system |  |  |  |  |  |  | x |  |
| to understand the diversity and state-of-the-art in area of information system |  |  |  |  |  |  | x |  |
| to be able to analyse, model, and evaluate organization's business processes from the perspective of information systems development  |  |  |  |  |  |  | x |  |
| to be able to apply various methods of information systems analysis |  |  |  |  |  |  | x |  |
| **1** | **2** |  | **4** |  | **6** | **7** | **8** | **9** |
| to understand problems of users of information systems, to be able to identify, analyse and specify user requirements  |  |  |  |  |  |  | x |  |
| to be able to manage information systems development projects and identify, analyse, evaluate, and solve the arising management problems  |  |  |  |  |  |  | x |  |
| to be able to identify, analyse, and understand unorthodox problems of information systems development |  |  |  |  |  |  | x |  |
| to be able to apply various methods of information systems design |  |  |  |  |  |  | x |  |
| to be able to apply methods of knowledge, metadata analysis and information safety engineering |  |  |  |  |  |  | x |  |
| **1** | **2** |  | **4** |  | **6** | **7** | **8** | **9** |
| to be able to identify, find and evaluate information relevant to information systems by using data bases and other sources of information |  |  |  |  |  |  |  |  |
| to be able to apply various computerized tools for model driven information systems analysis and design |  |  |  |  |  |  |  |  |
| to be able to choose and apply various technologies of information systems' development |  |  |  |  |  |  | x |  |
| to be able to apply various tools for management of information systems projects |  |  |  |  |  |  |  |  |
| to be able to develop innovative decisions for IT business creation and support |  |  |  |  |  |  |  |  |
| **1** | **2** |  | **4** |  | **6** | **7** | **8** | **9** |
| to be able to think systematically when analysing different situations, solving problems and tasks |  |  |  |  |  |  | x |  |
| to be able to apply the acquired knowledge creatively |  |  |  |  |  |  |  |  |
| to be able to work individually with minimum guidance, manage one’s work and time |  |  |  |  |  |  |  |  |
| to be able to work efficiently in a group, manage the team, and act collectively |  |  |  |  |  |  |  |  |
| to be able to understand the impact of information systems solutions on the society and environment and their economic aspects |  |  |  |  |  |  | x |  |

**Tabl.5**

# Course Descriptors

|  |  |
| --- | --- |
| **Course title:** | **ІT – infrastructure** |
| **Course unit code** | ITIS |
| **Course Program:** | MPIS |
| **University delivering the course:**  | VNTU |
| **Type of course unit** | Core course |
| **Level of course unit** | Masters level |
| **Number of ECTS credits allocated** | 5 Credits (150 hours of student work) |
| **Mode of delivery** | lectures, workshop, business games, independent work, distance learning… |

# Module Structure:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Type** | **Course** | **CP****(h)** | **Presence****(h)** | **Self-Study****(h)** |
| 1 | Course | **ІT – infrastructure** | 150 | 40 | 110 |

# Relevant Work:

|  |  |  |
| --- | --- | --- |
| **Number and Type; Connection to Course** | **Duration** | **Part of final mark in %** |
| Final Written Exam | 90 min. | 60 % |
| 4 Exercises, case study with presentation | Each 10 pages + 20 min. presentation | 40 % |

**Distribution of the final grade** (In accordance with the internal rules of Vinnytsia State Technical Universyty)

|  |  |  |
| --- | --- | --- |
| **Type of activity** | **Number of activities** | **Part of final mark in %** |
| Seminar papers, presentations | 6 | 18 |
| Lab results  | 4 | 12 |
| Course analytical work | 1 | 10 |
| Participation in company tour | 1 | 5 |
| Module marks  | 2 | 20 |
| Other |  | 10 |
| Final Written Exam |  | 25 |

**List of Course Learning Outcomes for IT infrastructure (ITIS)**

|  |  |
| --- | --- |
| **Code of Learning Outcomes** | **Course Learning Outcomes** |
| ITIS1 | to know the basic notions, designations and components of IT- infrastructure |
| ITIS 2 | to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection |
| ITIS 3 | to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions |
| ITIS 4 | to be able to apply international and national standards in the process of creation and usage of IT- infrastructure |
| ITIS 5 | to understand the ways of services rendering from the information services providers  |
| ITIS 6 | to understand the basic methods of IT- infrastructure monitoring and control |
| ITIS 7 | to understand the necessity and the ways of new information technologies monitoring |
| ITIS 8 | to understand the sources of infrastructure risks and methods of their reduction |

**Tabl.6**

**Correlation matrix of Programme Learning Outcomes and IT infrastructure (ITIS)**

**Course Learning Outcomes**

|  |  |  |
| --- | --- | --- |
| **Programme Learning Outcomes** | **Course Learning Outcomes** | **Code** |
| **1** | **2** | **3** |
| to understand essential concepts, facts, principles, and theories of information system | to know the basic notions, designations and components of IT- infrastructure | ITIS 1 |
| to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 |
| to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to understand the diversity and state-of-the-art in area of information system | to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 |
| to understand the basic methods of IT- infrastructure monitoring and control | ITIS 6 |
| to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to be able to analyse, model, and evaluate organization's business processes from the perspective of information systems development  | to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 |
| to understand the ways of services rendering from the information services providers | ITIS 5 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to be able to apply various methods of information systems analysis | to understand the basic methods of IT- infrastructure monitoring and control | ITIS 6 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to understand problems of users of information systems, to be able to identify, analyse and specify user requirements  | to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to be able to manage information systems development projects and identify, analyse, evaluate, and solve the arising management problems  | to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 |
| to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 |
| to be able to apply international and national standards in the process of creation and usage of IT- infrastructure | ITIS 4 |
| to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to be able to apply various methods of information systems design | to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 |
| to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 |
| to be able to apply international and national standards in the process of creation and usage of IT- infrastructure | ITIS 4 |
| to be able to apply methods of knowledge, metadata analysis and information safety engineering | to understand the sources of infrastructure risks and methods of their reduction | ITIS 8 |
| to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 |
| to be able to apply international and national standards in the process of creation and usage of IT- infrastructure | ITIS 4 |
| to be able to identify, find and evaluate information relevant to information systems by using data bases and other sources of information | to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |
| to be able to develop innovative decisions for IT business creation and support | to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |
| to be able to apply the acquired knowledge creatively | to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |
| to be able to understand the impact of information systems solutions on the society and environment and their economic aspects | to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |

**Tabl.7**

**ІT – infrastructure Learning Outcomes**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Themes** | ***Theoretical component*** | ***Practical component*** | ***Learning Objectives*** | ***Learning Outcomes*** |
| **Professional** | **Personal & Social** |
| **MODULE 1. General characteristic of IT-infrastructure** |
| **1** | **2** | **3** | **4** | **5** | **6** |
| Topic 1.1. Basic definition and components of «IT-infrastructure» | The main sub-topic1.1.1. Definition of the notion «IT-infrastructure».1.1.2. Examples of IT-infrastructure.1.1.3 Lifecycle of IT-infrastructure.1.1.4 Evolution of IT- infrastructure1.1.5 Data storage infrastructure.1.1.6. Infrastructure of data processing center (DPC)1.1.7. Software infrastructure. | Lab 1: Analyses of IT infrastructure of company | To learn about definition and examples of IT-infrastructure global information infrastructure, information infrastructure of the state, distance learning, networking mass media; lifecycle of IT-infrastructure: creation, use, modernization; data storage organization and networks; storage devices of data storage systems, reliability of data storage; Infrastructure of data processing center (DPC), basic servers platforms of DPC, computational infrastructure of DPC, network infrastructure of DPC, engineering infrastructure of DPC; composition and designation of IS software, standard and specialized software, trends of IS software development.  | ITIS 1 To know the basic notions, designations and components of IT- infrastructureITIS 2 to know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 7 |
| Topic 1.2. Standards, politics, basic laws and legislation acts for corresponding infrastructure solutions | The main sub-topic1.2.1. Intellectual property.1.2.2. Taxation of the activity of IT companies1.2.3 Standards in the sphere of IS | Lab 2: Development of structured schema of basic documents relations | To learn about competition between the norms of Civil Code of Ukraine and special laws in IS, peculiarities of realizationand protection of intellectual properly in electronic form, disposal of properly rights on data bases, forms of rewards for usage of the object of intellectual properly; IS audit and assurance standards, ISO management system standards, security standards, Control Objectives for Information and Related Technologies (CobiT) standards. | ITIS 3 to understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutionsITIS 4 to be able to apply international and national standards in the process of creation and usage of IT- infrastructure | ITIS 7 |
| **MODULE 2. Analyses and monitoring of IS solutions** |
| **1** | **2** | **3** | **4** | **5** | **6** |
| Topic 2.1. Infrastructure vendors | The main sub-topic2.1.1. Infrastructure contracts2.1.2. Virtual solutions and cloud services | Lab 3: Development of recommendation to selection of infrastructure vendors | To learn the interaction of information infrastructure and vendors of IS, types of contracts and agreements, content of agreements: Spin contract, Fixed Price / Fixed Scope, Time and Materials, Time and Materials with fixed scope and limited expenses, Time and Materials with Variable Scope and limited expenses, Bonuses and penalties, Fixed income, Joint-ventures; advantages and disadvantages of infrastructure outsourcing; Service Level Agreement (SLA); management of IT-infrastructure; basic notions and definitions of virtualization, advantages and disadvantages of virtualization. Types of virtualization, virtualization of platforms and virtualization of resources, means of virtualization; cloud services. | ITIS 5 to understand the ways of services rendering from the information services providers  | ITIS 7 |
| Topic 2.2.Infrastructure risks | The main sub-topic2.2.1. Notions and sources of information risks2.2.2. Systems of IS monitoring and control.2.2.3. The influence of Information security to Infrastructure risks2.2.4. Unified communication | Lab 4: Analyses of company’s IT infrastructure risks | To learn about essence of monitoring in the system of IS control, requirements to IS monitoring system, systems of IS monitoring support; infrastructure risks: technological, financial, technical, integration risks; methods of information risks assessment; the influence of Information security to Infrastructure risks; monitor infrastructure status from multiple perspectives and take appropriate action in case of irregularities; design and document appropriate processes for risk analysis and management. | ITIS 6 to understand the basic methods of IT- infrastructure monitoring and controlITIS 8 to understand the sources of infrastructure risks and methods of their reduction | ITIS 7 |
| Topic 2.3. Monitoring of New Technologies | The main sub-topic2.3.1 Essence and means of new information technologies monitoring  | Analytical paper: New technologies in some aspect of IT infrastructure | To learn the requirements to IT monitoring system, means of IT monitoring support.  | ITIS 7 to understand the necessity and the ways of new information technologies monitoring | ITIS 7 |

**Tabl.8**

**Characteristics of Learning Outcomes for IT infrastructure**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Learning Outcomes** | **Code of Learning Outcomes**  | **Knowledge** | **Skills** | **Communication** | **Autonomy and responsibility** |
| **1** | **2** | **3** | **4** | **5** | **6** |
| To know the basic notions, designations and components of IT- infrastructure | ITIS 1 | Basic notions, designations and components of IT- infrastructure | Analyze IT infrastructure of company | Ability to *explain* basic notions, designations and composition of IT- infrastructure |  |
| To know the basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | ITIS 2 | Basic types of IT- infrastructure solutions and to understand the methods of their optimal selection | Choose the type of IT- infrastructure solution | Ability to *explain* basic types of IT- infrastructure solutions and to *demonstrate* the methods of their optimal selection | Ability to *make decisions* on the choose of the type of IT- infrastructure solution |
| To understand the information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | ITIS 3 | Information politics and to know the fundamental laws and legislation acts for relevant infrastructure solutions | Use the laws, legislation acts and corporate information politics | Ability to *explain and discuss* the information politics, fundamental laws and legislation acts for relevant infrastructure solutions | Be *responsible* on the use the laws, legislation acts and corporate information politics |
| To be able to apply international and national standards in the process of creation and usage of IT- infrastructure | ITIS 4 | International and national standards in the process of creation and usage of IT- infrastructure | Apply international and national standards in the process of creation and usage of IT- infrastructure | Ability to *explain and discuss* the international and national standards in the process of creation and usage of IT- infrastructure | Be *responsible on the* application of international and national standards in the process of creation and usage of IT- infrastructure |
| To understand the ways of services rendering from the information services providers  | ITIS 5 | Ways of services rendering from the information services providers  | Contract the information services providers  | Ability to *explain, discuss and justify the* ways of services rendering from the information services providers, *demonstrate* information service contract | Ability to *make decisions* on contract the information services providers and be *responsible of it* effects |
| To understand the basic methods of IT- infrastructure monitoring and control | ITIS 6 | Basic methods of IT- infrastructure monitoring and control | Choose a method of IT- infrastructure monitoring and control | Ability to *explain, discuss* and *demonstrate* basic methods of IT- infrastructure monitoring and control | Ability to *make decisions* on the choose of the method of IT- infrastructure monitoring and control |
| To understand the necessity and the ways of new information technologies monitoring | ITIS 7 | Ways and methods of new information technologies monitoring | Monitor of the new information technologies | Ability to *explain* the necessity and *demonstrate* methods of new information technologies monitoring | Be *responsible* on the monitoring of the new information technologies |
| To understand the sources of infrastructure risks and methods of their reduction | ITIS 8 | Sources of infrastructure risks and methods of their reduction | Analyze the sources of infrastructure risks and choose the methods of their reduction | Ability to *explain and discuss* the sources of infrastructure risks and methods of their reduction | Ability to *make decisions* on the choose the methods of infrastructure risks reduction |

# Recommended or required reading

|  |
| --- |
| **Main:**1. Bernard, Scott A.; Introduction to Enterprise Architecture; Publisher: authorHOUSE™; 2005
2. ITIL - IT Infrastructure Library - Available at <https://www.axelos.com/store>
3. James O'Reilly Network Storage // Elsevier / Morgan Kaufmann. - 2016, 280 p.
4. Todd Lammle, Todd Montgomery CCNA Data Center: Introducing Cisco Data Center Technologies Study Guide // Publisher: Wiley/Sybex, 2016, 288 p.
5. Rick van der Lans Data Virtualization for Business Intelligence Systems // Elsevier / Morgan Kaufmann.-2012, 296 p.
6. Gillam, Lee Cloud Computing: Principles, Systems and Applications / Nick Antonopoulos, Lee Gillam — L.: Springer, 2010. — 379 p. — (Computer Communications and Networks). — ISBN 9781849962407
7. Harris Michael D. S., Herron David, Iwanicki Stasia. The Business Value of IT: Managing Risks, Optimizing Performance and Measuring Results. CRC Press, 2008
8. Laudon K.C., Laudon J.P. (2015). Management Information Systems: Managing the Digital Firm. Global Edition (14th ed.). Harlow: Pearson Education.
9. Book: [Keshari](https://www.google.li/search?tbo=p&tbm=bks&q=inauthor:%22Surendra+Keshari%22&source=gbs_metadata_r&cad=2), S., & [Kumar](https://www.google.li/search?tbo=p&tbm=bks&q=inauthor:%22Narendra+Kumar%22&source=gbs_metadata_r&cad=2), N. (2013). IT Infrastructure and Management. I.K. International Publishing House Pvt. Limited.
 |
| **Additional:**1. Alter, Steven, "Work System Theory: Overview of Core Concepts, Extensions, and Challenges for the Future" (2013). Business Analytics and Information Systems. Paper 35.
2. Adner, R., & Kapoor, R. (2016). Right Tech, Wrong Time. Harvard business review, 94(11), 60-67.
3. Олейник А. И., Сизов А. В. ИТ-инфраструктура [Текст]: учеб.-метод. пособие / А. И. Олейник, А. В. Сизов; Нац .исслед. ун-т «Высшая школа экономики». — М.: Изд. дом Высшей школы экономики, 2012. — 134 с.
4. Cisco, Cisco Data Center Infrastructure 2.5 Design Guide, Cisco Press, 2010.
5. Mark Williams - A Quick Start Guide to Cloud Computing: Moving Your Business Into the Cloud. // Kogan Page , 2010 , 152 pp
6. Зайнуллин С.Б. Корпоративная безопасность: Учебное пособие. - М., 2016. - 124 с.
7. Кожушко Р.Ю. Інтелектуальна власність: навчальний посібник/ Р.Ю.Кожушко, М.В.Колосніченко, І.П.Остапчук та ін. – К.: КНУТД, 2014. – 108 с.
8. COBIT Quickstart
9. COBIT 4.1 Excerpt
10. COBIT Security Baseline
11. COBIT Control Practices
12. COBIT Control Objectives
13. COBIT Mapping: Mapping of ISO/IEC 20000 with COBIT 4.1 (e-book)
14. COBIT Mapping: Mapping of CMMI for Development V1.2 with COBIT 4.1 (e-book)
15. COBIT Mapping: Mapping of CMMI for Development V1.2 With COBIT 4.0 (e-book)
16. COBIT Mapping: Mapping FFIEC with COBIT 4.1 (e-book)
17. COBIT Mapping: Mapping ITIL V3 With COBIT 4.1 (e-book)
18. COBIT Mapping: Mapping PMBOK to COBIT 4.0 (e-book)
19. ISO/IEC 15288:2008 System and software engineering - System life cycle processes.
20. ISO/IEC 42010 IEEE Std 1471-2000 System and software engineering - Recommended practice for architectural description of software-intensive systems.
21. ISO/IEC 90003:2004 Software engineering - Guidelines for the application of ISO 9001:2000 to computer software.
22. ISO/IEC TR 90005:2008 Software engineering - Guidelines for the application of ISO 9001:2000 to system life cycle processes.
23. ISO/IEC 9126-1÷4:2001÷2006 Software engineering - Product quality - Part 1÷4
24. ISO/IEC 25051:2006 Software engineering - Software product Quality Requirements and Evaluation (SQuaRE) -Requirements for quality of Commercial Off-The-Shelf (COTS) software product and instructions for testing.
25. IEEE 829-2008 Standard for Software and System Test Documentation.
26. ISO/IEC 14598-1÷6:1999÷2001 Information technology - Part 1÷6.
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4. Рекомендации по контролю работоспособности ИТ-инфраструктуры от IBM [Электронный ресурс]. URL: <http://www.cybersecurity.ru/programm/34942.html> (Дата обращения 21.02.13).
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# Planned learning activities and teaching methods

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| The primary means of learning for student is through practice. This is supported and developed through:1. Project briefings.
2. Set and self-initiated project briefs.
3. Peer learning.
4. Self and peer assessment.
5. Guest speakers.
6. Group discussions, reviews and critiques;
7. Working on live projects;
8. Mentoring;
9. Blended learning, part of themes can be move to such study form;
10. Online lectures;
11. Case studies
12. Independent study;
13. Company visits and tours.

***For flexible and distributed learning***Web-based sessions lead by instructor provide methodological and conceptual framework for students’ learning. All the slides and materials from the class will be available electronically. Web-based seminars will be used to strengthen the knowledge of newly learned methods and concepts, and to explore their application to particular complex business cases. Students are encouraged to ask questions and discuss the material in “live” mode online. There will be a web-based message board for the course. Students are welcome to post questions on this board and these discussions will be monitored and facilitated by the lecturer. The main accent will be made on independent learning |

# Assessment methods, criteria and regime

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| Progress and learning is assessed not only at the end but throughout the entire course. Evidence of an ability to think through and critically analyze challenges will be highly rewarded in the assessment. Students' grades will be determined by individual **Assignments**, based on description of the key idea, normative regulation and steps necessary to build innovation pipeline and supply it with ground-breaking ideas.In the overall assessment, distance learning courses at МООC platforms (Coursera, Prometheus, MIT etc.) for individual topics.* The relative weight of **Assignment Brief for main** kind of activities will be set at100%. It will be marked on the basis of: Analytical works and projects 40%; Theory learning (by results of exam) – 35%; Laboratory work 25%. The part of theory learning outcomes could be replaced by received certificates at МООC platforms
* The relative weight of **Assignment Brief for analytical works** will be set at100%. It will be marked on the basis of: The aim of the report clearly formulated 20%; Coherence of the arguments and reflection 10%; Reflection based entirely on the description of facts and events 40%; Utilization of adequate terminology to describe the project management 20%; Evidence of activities undertaken
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**Specialized facilities and/or equipment essential for the delivery of the course**

Specialized facilities and/or equipment essential for the delivery of the course include examples of hardware and software of IT infrastructure (Local computer net, Internet connection, Cloud database and software resources, Elements of security system etc.