| Name of subject | Information technology in technical systems (ECTS 4 ) |
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| Subject/module code | TTAT1304 |
| Science taught semester (s). | 3rd semester |
| Responsible teacher | Burliyev Abdulla Ubaydullaevich, senior teacher. |
| Education language | Uzbek |
| Study to the program connection | Compusory |
| Training hours (this including independent education) | **Total hours - 120.**<br>**Auditory training hours - 48.**<br>Lecture session hours – 24<br>Practical training - 12<br>Laboratory hours - 12<br>**Independent education -72 hour** |
| ECTS | 4 |
| The purpose and tasks of subject / learning outcomes | **The purpose of teaching the subject** is to help students in the age of digital technology. modern information communication technologies application method and tools, computer modeling, principles of programming technologies from developing the skills to teach and apply them in practice consists of.<br>**The task of the subject** is education directions according to applicable automated design systems using solving problems , modeling, design and product design working exit and knowledge of the essence of programming, and the scientific understanding of students in relation to them information and communication technologies through the formation of worldviews opportunities manifestation to grow.<br>**Learning outcomes:**<br>1. Will gain skills in intelligent control systems and artificial intelligence, expert systems.<br>2. Will acquire skills in modern automated design systems and their application in technical fields .<br>4. Will acquire skills to work independently in graphic modeling programs and geoinformation system programs.<br>5. On the network reliability increase for backup , monitoring and other methods by hand takes ;<br>6. Information database , cloud technologies about to knowledge has will be ; |
| Course content ( topics ) | **I. Main Theoretical Part (Lecture Sessions)**<br>**1-topic. "Technical" in systems information technologies" science subject and tasks.**<br>"Technical" in systems information technologies" science subject and styles. Technical in systems information communication technologies (ICT) main functions and application in the field of information technology. ICT in Uzbekistan field in development main directions, current laws, Decrees of the President of the Republic of Uzbekistan and the Cabinet of Ministers decisions. In the republic computerization and ICT develop programs, tasks study. ICT technician in the directions implementation to grow principles, digital the economy develop for the purpose digital infrastructure modernization to do. Technical in systems management for modern application of technologies. Computer ethics.<br>**2-topic. Intellectual management systems. Expert systems**<br>Intellectual systems purpose, functions and methodology. Expert |

systems. Expert system structural part. Expert systems classification, structure structure.

**3-topic. Modern automated design systems and them technician in the fields application.**

Design processes and stages. In automated design used model and parameters classification. Automated design systems structure and types. Synthesis and analysis issues. Create analytical, parametric and numerical models based on a conceptual design and analysis.

**4-topic. Mathematician modeling, numerical analysis methods in systems done increase. Accountable experiment.**

Mathematica, Maple, Matlab, MathCAD programs in the example static and dynamic models done increase. System in the composition programming.

**5-topic. Graphic modeling. Design in the process practical graphic programs from the possibilities use.**

3D Max, CATIA, KOMPAS, Solid Works, AutoCAD, Parasolid, Solid Edge, CorelDraw practical programs in the example of graphic modeling.

**6-topic. Imitation modeling.**

Imitation models and their types. To the parameter based models in the system application. Proteus, Simulink, PCAD, T-Flex practical in programs imitation models create.

**7-topic. Geoinformation systems.**

Geoinformation systems classification, models features and Application method: Micro Main, Main Tenance, Premium, Geologia Surpoc, Arc GIS practical in programs modeling and design.

**8-topic. Network information base. Cloudy technologies.**

Databases and their models on the Internet. Clipper, Application of Oracle, MySQL systems in technical and technological processes. Cloudin technologies SaaS, PaaS and IaaS models.

**9-topic. Information security in technical and technological processes to provide.**

Bank in systems, in geosystems, electromechanical in systems, modern information protection in biosystems, monitoring systems methods current to, information protection to do tools and methods efficiency assessment, information protection to do software and technician Use of tools. Study of cryptographic methods of information security and them information safety in increasing application. Best Crypt, Pretty Good Privacy, InfoWatch CryptoStorage programs.

**10-topic. Technical in systems network safety.**

Information communication technologies safety provide software and hardware that enables the exchange and transmission of data for the purpose of installing, configuring, and testing networks, including hardware systems Perform a transfer. Prevent cyber attacks that affect system performance mechanisms for detecting and protecting against threats, and repelling attacks study. Comodo Firewall Pro, Avast Internet Security, AVG Internet Security, Outpost Firewall, Zone Alarm Free Firewall, Kerio Winroute Firewall from cross-network screen programs use.

**11-topic. Modern programming technologies. To the object**

**object-oriented programming languages.**

Modern programming technologies. Programming languages and systems, their usage and classification. Programming of languages main modules.Programming systems place, task technician issues in solution JavaScript, Java, Python, Ruby, PHP, C++, CSS, C#, Objective- C programming in systems software create applications learning styles.

**12- topic. Basic constructs of the C++ programming language and features of its use in the system.**

Program structure. C++ programming of the language main constructions, Features of their use. Operators, categories, procedures. Program Project structure. Cases and forms of program creation. Program structure parts. Various technician in the fields of information categories structure. Linear computational processes programs. Examples in technical systems linear programming application. Identifier, variables categories (types). Input and output of data, manipulation in the algorithmic language S++ as a row, format specifications and modifiers, standard librarytitle files .

**II. Instructions and recommendations for organizing practical training.**

The teacher's preparation for a practical session begins with studying the initial documents (curriculum, thematic plan, etc.) and ends with the development of a lesson plan. The teacher should have an idea of the goals and objectives of the practical session, as well as the amount of work that each student must perform.

Methodological guidelines are the teacher's main methodological document in preparing and conducting practical classes.

The goal of practical training is to understand theory and acquire skills. Its conscious application in educational and professional activities consists in developing the ability to confidently formulate one's own point of view.

All practical work and exercises are done on computers. Students will be able to from EXM in the power supply system during execution use and EXM issues at solution according to skills they produce

**Recommended topics for practical training:**

1. Practical programs using engineering issues mathematician models create (Mathematica, Maple, Matlab, MathCAD).
2. Design in the process practical programs graphic from the possibilities use and visualization (3D Max, CATIA, COMPASS, Solid Works, AutoCAD, Parasolid, Solid Edge, CorelDraw).
3. Creating simulation models in practical programs (Proteus, Simulink, PCAD, T-Flex). Representing engineering problems and developing models in geoinformation systems.
4. Protection cryptographic from the methods use.
5. To the object directed programming technologies.
6. Logical programming technology.
7. Programming in systems applications create technology

**III. Guidelines and recommendations for organizing laboratory exercises.**

In laboratory classes, students develop practical skills and competencies in calculating and drawing tables and graphs, conducting experiments, and analyzing various indicators of processes in electrical networks and systems. The proposed topics are selected based on opportunities and conditions.

**Suggested topics for laboratory exercises:**

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| | 1. CAD systems practical programs interface study andapplication.<br>2. Mathematics in solving engineering problems in CAD systemsto the models calculation experiment and numerical perform the analysis increase.<br>3. Technical to objects relevant graphic models practical in programs to express, recycling and visualization.<br>4. Technical to objects imitation models create and analysis to grow.<br>5. Identify and mitigate cyber attacks that affect system<br>6. To the object directed programming in systems structural applicationscreate.<br>7. Engineering in solving problems programming systems using graphics and multimedia from the possibilities use.<br>8. Internet on the network information base software system tools create using<br><br>**IV. Be careful . study and independent work.**<br>Independent learning competence serves to support students' independent self-development and increase the effectiveness of professional activities. Students perform independent work on their mobile devices under the guidance of a teacher in a traditional or electronic form.<br>**Recommended topics for independent study:**<br>1. Digital the economy in development information communication technologies place.<br>2. In Uzbekistan information communication field in development main directions, current laws, President of the Republic of Uzbekistan decrees and resolutions of the Cabinet of Ministers decisions.<br>3. Systematic and practical software of supply development trends.<br>4. The role of expert systems in management and their application<br>5. Intelligent control systems in roboticsapplication prospects<br>6. Automated design systems in mechanics, energy,electronics, geology, mechanical engineering and other in the fields application.<br>7. Application of three-dimensional graphics capabilities in design technologies.<br>8. Geoinformation systems application problems.<br>9. Cybersecurity on the surface international documents and edge hand countriesexperience.<br>10. Information communication in systems information safety.<br>11. Non-standard modules create and them in the program application.<br>12. Web to program based practical systems. |
| Student assessment | Assessment of student knowledge is based on the mastery of teaching materials (tests, assignments, written and oral work results) during the semester and final examination.<br>During the Information technology in technical systems course, students are assessed on a 100-point scale. Of these, 50 points are allocated to the current and intermediate results (60% of the 50 points are current control, independent study and 40% intermediate control), and 50 points are allocated to the final control result. Students whose total current and intermediate scores are less than 30 points are not admitted to the final control exam. A student who scores 30 or more |

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| | points in the final control is considered to have mastered the subject. |
| Exam requirements | The student must have fully mastered the theoretical and practical concepts of the subject, be able to correctly reflect the results of the analysis. The student must have completed the tasks given in the current and intermediate forms of independent work, assessment. At the same time, he must have received the necessary points from the current, intermediate, independent education and final tests in the relevant subject within the specified time.<br>A student who has not submitted current control, intermediate control and independent education tasks, as well as who has scored less than 30 points on these tasks and types of control, will not be included in the final type of control.<br>Also, a student who has missed 25 or more percent of the classroom hours allocated to the subject without an excuse will be expelled from this subject, will not be allowed to take the final exam and will be considered as not having mastered the relevant credits in this subject.<br>A student who fails the final exam or scores less than 30 points on this type of exam is considered academically indebted. |
| Recommended Literature | **Main literature**<br>1. Kadyrov MM "Information Technologies" textbook, part 1, T.: "Sano-standard" publishing house, - 2018, 320 page.<br>2. Kadyrov MM Technical in systems information technologies Part 2: textbookG' MM Kadyrov - Tashkent: "Philosophers of Uzbekistan are national society", Tashkent 2019, 306 page.<br>3. R.A. Adabaeva, Sh.T.Nasridinova, NX Shoakhmedova, LT Ibragimova, Sh.T. Ermatov. "Information and communication" technologies and systems» - T.: "Sano-standard" publishing house, - 2017, 552 page.<br>4. Kenjabayev AT, Ikromov M.M., Allanazarov A.Sh. "Information-"<br>communication technologies» study manual. – Tashkent: "Uzbekistan" philosophers national society» publishing house, Tashkent 2017,408 page.<br>**Additional literature**<br>5. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. PF-4947- number "Uzbekistan" Republic further develop according toAction strategy about decree.<br>6. Nazirov Sh.A., Qobulov RV, Bobojonov MR, Rakhmanov QS C and C++ language. Successor-publisher. Tashkent 2013. 488 b.<br>7. Kenneth C. Laudon, Jane. P. Laudon. Management Information Systems: Managing the Digital Firm, 13th Edition, Pearson Education, USA 2014.P 621.<br>8. Kunwoo Lee. Principles of CADG'CAMG'CAE: The Computer Aided Engineering Design Series. 5th Edition. Addison Wesley Longman, USA,2015.<br>9. Alex Allain. Jumping into CQQ. USA, 2014. p. 340.<br>10. Azimdzhanova MT, Muradova MT, Pazilov MS, Computer science and information technologies study manual – Tashkent: "Uzbekistan" philosophers national society» publishing house, Tashkent 2013, 176 page.<br>11. M. Aripov, S. Dottoyev, M. Fayziyeva. study manual – Tashkent:<br>"Uzbekistan" philosophers national society» publishing house, |

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| | Tashkent 2013,280 page.<br>12. SK Ganiev, MM Karimov, KA Tashev. Information safety. – T.:"Science and Technology", 2017, 372 pages.<br>**Information sources**<br>13. www.lex.uz – Uzbekistan Republic Law documents informationnational base.<br>14. www.ziyonet.uz – Uzbekistan Republic education portal. . |