ДОНСКОЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

УПРАВЛЕНИЕ ДИСТАНЦИОННОГО ОБУЧЕНИЯ И ПОВЫШЕНИЯ КВАЛИФИКАЦИИ

Кафедра «Научно-технический перевод и профессиональная коммуникация»

МЕТОДИЧЕСКИЕ УКАЗАНИЯ

для самостоятельной работы студентов технических специальностей, обучающихся по курсу

«Technology 1»

Составители
Шаповалова Ю.В.
Волкова Т.В.
Панкова В.В.

Ростов-на-Дону, 2011

Аннотация

Данные методические указания созданы на базе действующей программы и могут быть использованы студентами любых технических специальностей для развития навыков чтения, перевода, говорения, аннотирования текстов технической направленности.

Составители

к.ф.н., доц. Шаповалова Ю.В.,

к.ф.н., доц. Волкова Т.В.,

к.филолог.н., доц. Панкова В.В.

Оглавление

ЧАСТЬ I

Unit 1 Technology and Society

I. Add to your active vocabulary:

1.	technology	a) техника; технические и прикладные науки b) технология c) специальная терминология; методика
2.	state-of-the-art technology	самая современная технология
3.	application	применение, использование, употребление; приложение; применимость
4.	to improve	улучшать; совершенствовать; налаживать
5.	to design	a) проектировать; конструировать b) задумывать, разрабатывать; намереваться, собираться (сделать что-л.)
6.	to test	a) подвергать испытанию, проверке; b) тестировать, проверять; производить опыты
7.	technician	a) техник; b) человек, знающий свое дело; специалист c) лаборант
8.	technologist	a) технолог; b) техник
9.	engineer	инженер; конструктор; механик
10.	electrical engineer	электротехник
11.	highway engineer	дорожный инженер
12.	civil engineering	a) искусство/техника строительства b) гражданское строительство
13.	mechanical engineering	машиностроение
14.	electrical engineering	электротехника
15.	marine engineering	кораблестроение
16.	fibre (fiber) optics	волоконная оптика
17.	satellite	искусственный спутник

18. debit card	дебетная карта (карта, аналогичная кредитной, все расходы по которой немедленно перечисляются с соответствующего счета)
19. ATM automatic teller machine	банковский автомат, банкомат
20. Business-to-business (B2B)	взаимодействие "бизнес-бизнес", операции между компаниями (сфера рыночных отношений, соответствующая трансакциям между юридическими лицами (компаниями)
21. efficiency	a)продуктивность, производительность; b)(*техн.*) отдача, коэффициент полезного действия
22. power	a) мощность; энергия; b) степень; показатель степени; c) способность; возможность; d) (оптическое) увеличение; e) производительность
23. medicine	лекарство, медикамент, медицина
24. sewerage	a) канализация, канализационная система b) сточные воды, нечистоты
25. waste disposal	a) удаление отходов; захоронение отходов b) сброс (отведение) сточных вод
26. manufacturing	a) производство; изготовление b) обработка
27. robotics	робототехника
28. minerals	полезные ископаемые
29. challenge	a) вызов б) сложная задача, проблема
30. to eliminate	a)устранять, исключать (from) b) уничтожать, ликвидировать, аннулировать c) игнорировать, не замечать, пренебрегать

II . Read and translate the text Technology and society:

The purpose of technology is to produce applications which improve our material environment. The people who design, test, and make these applications are called technicians, technologists, and engineers. They work in areas such as civil, mechanical, electrical, electronic, and marine engineering, and in newer fields such as information technology (IT). They use scientific knowledge and technological experience in their work. They often adapt older existing technol-

ogy (e.g. radio waves) to create new applications (e.g. mobile phones).

Technology is all around us and affects every aspect of our lives. Here are some examples:

• **transport** - road, sea, and air travel; space exploration.

• **telecommunications** - mobile phones, fibre-optics, internet, satellites.

• **trade** - credit and debit cards, bank ATM machines, Business-to-business (B2B) internet trade.

• **work efficiency** - washing machines, microwave ovens, computer software.

• **power** - heating, lighting, air conditioning.

• **personal entertainment** - DVDs, iPods, digital TVs, digital cameras.

• **health -** lasers in eye surgery, medicines.

• **safety and security -** ABS brakes, air bags, sensors, smoke detectors.

• **food -** food processing, agriculture.

• **information management -** computer databases, search engines, business software.

• **infrastructure -** roads, buildings, sewerage, waste disposal, water supply.

• **manufacturing -** robotics in mass production (manufacturing an item in very large numbers).

Because technology is so important in society, technicians, technologists, and engineers always have to think about values, that is, whether something is good or bad. Unfortunately, some technology has both positive and negative effects on society. Using minerals such as oil, coal, iron, and uranium improves our standard of living, but can also pollute the air, water, and ground. The same rockets that allow space exploration can carry nuclear weapons. Road vehicles and planes allow fast travel but also cause accidental deaths and create global warming. The challenge for technology is how to increase the positive effects on society but reduce or eliminate the negative effects.

Unit II Studying technology

I. Add to your active vocabulary:

31. level	a)уровень; b)степень, ступень; c)плоская, горизонтальная поверхность
32. advanced	a)современный, передовой; b)развитый; отлаженный, отработанный
33. hold – held - held	a)занимать (пост, должность и т. п.); иметь (звание, ранг и т. п.); b)держать содержать; хранить; c)владеть
34. university degree	университетский диплом, степень
35. title	звание; название
36. interchangeably	взаимозаменяемо
37. mean – meant - meant	a)иметь в виду; b)намереваться; c)думать, подразумевать; d) значить, означать
38. course at college	курс (лекций, обучения)
39. to offer	предлагать
40. to follow the route	следовать маршруту
41. bachelor	бакалавр
42. to allow	a)позволять, разрешать; b)предоставлять, давать возможность
43. to transfer	переходить; переводиться
44. apprentice	ученик; новичок
45. to release from	освобождать от
46. construction	сооружение, строительство
47. highway	a)шоссе, магистраль; b)главная линия связи, основной путь
48. harbour	гавань; порт
49. syllabus	программа обучения
50. surveying	обследование
51. to measure	измерять, мерить
52. site	место; стройплощадка; участок
53. to ensure	a)гарантировать, обеспечивать; b)застраховать
54. budget	бюджет; финансовая смета
55. safely	безопасно
56. fluid mechanics	гидромеханика
57. liquid	жидкость
58. to affect	иметь предрасположенность, тенденцию

59. pipeline	трубопровод, нефтепровод
60. dam	дамба, плотина, насыпь
61. property	a)свойство, качество; b)имущество; собственность
62. soil	грунт, земля, почва
63. rock	a)горная порода; b)скала
64. foundation	фундамент, основание
65. skills	навыки
66. matter	тема, вопрос, предмет (обсуждения и т. п.)
67. client	a)клиент; b) подчиненный
68. colleague	коллега, сослуживец
69. CAD (computer-aided design)	автоматизированное проектирование
70. surveyor	землемер; топограф; геодезист
71. architect	архитектор

II . Read and translate the text Studying technology:

What is the difference between a technician, a technologist, and an engineer? The main difference is in level of education and training. Engineers have the most advanced training and normally hold university degrees. In everyday contexts, the titles technician and technologist are sometimes used interchangeably, meaning a specialist working in technology below the level of engineer. In training contexts, technologist is normally used for someone at a higher level (usually trained for 2-3 years) than a technician (usually trained for 1-2 years).

You can progress from technician to technologist and then to engineer by following courses at colleges and universities. Colleges offer certificates and diplomas (a diploma is a higher level qualification than a certificate). Universities offer degrees.

As an example, in the UK system, most young people who want a career in technology start by studying at a college of further education or university. They would normally follow the route: HNC (Higher National Certificate) → HND (Higher National Diploma) → B.Eng →(Bachelor of Engineering degree). Some universities allow students to transfer to a degree course early, after completing only one year of a diploma course.

It is also possible for students to leave school at sixteen and work as an apprentice with a company. The company can then re-

lease them from work for some time every week to allow them to study at a college. This is called a part-time, day-release or 'sandwich' course.

In this unit, there is an example of a student, Alec, who is following an HND diploma course in civil engineering in a college in Scotland. Civil engineers work in the planning and construction of airports, bridges, highways, harbours, etc. The course syllabus includes the following subjects:

∗ **Construction surveying.** This teaches how to measure a site, and mark out lines and points from the plans on the ground.

* **Construction management.** This teaches how to ensure that a building project is completed on time, with the correct materials, within budget, and safely.

∗ **Fluid mechanics.** This teaches how liquids and gases move and affect structures. This is important in constructing pipelines and dams.

∗ **Geotechnics.** This teaches the mechanical properties of soil and rocks. This is important in constructing tunnels, pipelines, and foundations.

* **Complex communications** (sometimes called simply communication, or communication skills). This teaches how to communicate on technical matters. Working in technology you need to be able to speak and write effectively to clients, write clear reports, and give oral presentations to colleagues.

* **CAD** (Computer-assisted design). Surveyors and architects use computer software to help them draw plans and designs.

ЧАСТЬ II

Unit III Design

I. Add to your active vocabulary:

1. design	a) чертеж, эскиз; рисунок, узор b) модель, шаблон; композиция c) замысел, план
2. to include	включать в себя, содержать в себе
3. evidence	a) доказательство, подтверждение; свидетельство; b) основание; знак, признак
4. appearance	внешний вид, наружность
5. a series of	ряд, серия чего-то
6. stage, step	ступень, фаза, этап
7. need	необходимость, потребность
8. to solve (the problem)	разрешать (проблему и т. п.); находить выход;
9. to meet (fulfil) the needs	удовлетворять требования
10. to identify	определять, устанавливать
11. certain	некий; определенный
12. to invent	изобретать, создавать, придумывать
13. to modify	видоизменять, трансформировать, корректировать, вносить поправки
14. brief	сводка; резюме
15. investigation	исследование
16. to find out	узнать, выяснить; понять
17. available	a) доступный; имеющийся в распоряжении; b) (при)годный, полезный
18. durability	a) срок службы, долговечность; b) выносливость, живучесть
19. to evaluate	оценивать; давать оценку; составлять мнение; определять качество
20. at first	вначале, сначала; на первых порах
21. sketch	a) эскиз, набросок; b) описание в общих чертах
22. drawing	a) чертеж; b) рисунок, набросок, эскиз (сделанный ручкой, карандашом)

23.to consider	a)думать, полагать, считать; b)рассматривать, продумывать; c) принимать во внимание, учитывать
24.manufacturability	возможности производства
25.machinery	(машинное) оборудование
26.to realize	осуществлять; выполнять (план, намерение); реализовывать; претворить в жизнь
27.object	предмет; вещь; объект
28.CAD software	программное обеспечение САПР
29.to answer the question	ответить на вопрос

II . Read and translate the text Design and write annotation:

Design is at the heart of technology. This is why most technology courses include design in their syllabus. Look at any manufactured product, and you will see evidence of design. It may be beautiful, but appearance is only one aspect of design. It must also function well. The design process is a series of stages, or steps. It begins when someone notices that there is a need or problem in society which must be solved. It ends when a product is manufactured which meets or fulfils that need.

These are the stages of the design process.

• **Identify the problem.** For example: When a certain cooking pot is heated, the handle becomes too hot to touch. Sometimes the designer may have to invent a new product to solve the problem. At other times he or she may modify, or change, an existing design to improve it.

• **Write the design brief** (also called the design specification). This is a simple, clear statement of what is to be designed. For example: Design a handle that remains cool when the pot is heated.

• **Do an investigation.** The designer asks questions and finds out information to help design a good product: Who will use this product? What will it do? How will it look? What materials are available? How much will they cost? Do they have the right properties (such as durability)? How will the product be made? How can it be made safe?

• **Develop alternative solutions.** Here, the designer thinks of different ideas, writing them all down without evaluating

them at first. He or she will then produce sketches, or simple drawings, of the different designs.

• **Choose the best solution.** Here, the designer chooses the design which best solves the problem. He or she also considers cost, time, available materials, manufacturability (that is, whether it can be manufactured using available skills, tools, and machinery).

• **Make a model or prototype,** (also called the realization stage, when a design is realized or made into a real object). A detailed drawing is made, probably using CAD software. Then a model or prototype (= first working version) is manufactured (or a computer simulation maybe used).

• **Test and evaluate.** The prototype is physically tested and then evaluated to answer these questions: Does it work? Does it meet the design brief? Can it be improved in any way?

• **Manufacture.** If the final evaluation is positive, the company may decide to manufacture the product.

Unit IV Technology in Sport

I. *Add to your active vocabulary:*

1. to subject (to)	a)подвергать (воздействию, влиянию и т. п.; b)подчинять, покорять
2. powerful	мощный, сильный
3. to hit – hit - hit	ударять (on - по чему-л.); поражать; попадать в цель
4. impact	a) импульс, толчок; b) влияние, воздействие
5. to cause	послужить причиной/поводом для чего-л.
6. squeezing	сжатие; сдавливание
7. tension	a)напряжение, натяжение; b)растяжение, удлинение
8. bending	сгибание; изгибание
9. friction	трение, сила трения
10.clothing	a) одежда; b) обшивка, покрытие, облицовка
11.to wear (wore, worn) away; to erode	стирать(ся), постепенно уменьшать(ся),
12.fatigue	*тех.* усталость (металлов)

13.the same	один и тот же, тот же самый
14. to resist	противостоять; сопротивляться
15.equipment	оборудование; оснащение; арматура, оснастка
16.impact-resistant	ударостойкий
17.tough	a)крепкий, негнущийся, сильный; b) жесткий, плотный, упругий
18.to fit	a) подходить, быть подходящим для (чего-л.); b) быть впору
19.tightly	плотно прилегающий, тесный, тугой, узкий
20.rigid	жесткий, негнущийся, несгибаемый, твердый
21.original shape	первоначальная форма
22.strength-to-weight ratio	- удельная прочность (материала)
23.lightness	о весе легкость; легковесность
24.to mould	a) формовать, лепить б) отливать форму, формовать с) делать по шаблону; формировать по образцу (чего-л. - on, upon)
25.goggles	защитные (предохранительные) очки
26.polyurethane	полиуретан
27.polystyrene	полистирол
28.helmet	защитный головной убор, каска, шлем
29.fibreglass	стекловолокно
30.graphite	графит
31.carbon fiber	углеродное волокно
32.frame	рама, каркас
33.laminate	a) слоистый пластик; b)слоистый материал; c) изделие из слоистого материала
34.layer	слой, пласт; прослойка; прокладка
35.titanium	титан
36.aluminium	алюминий
37.alloy	a)сплав; b) лигатура, примесь
38.corrosion resistance	устойчивость к коррозии

II . Read and translate the text Technology in Sport and write annotation:

Modern sports materials are subjected to powerful forces.

When a racket hits a ball, the impact causes compression (= squeezing) and tension (= stretching), and may cause bending (= compression + tension). Repeated friction makes clothing wear (= erode) away. A bicycle pedal may break because of fatigue (= weakening) if it is turned the same way repeatedly.

Sports materials must have properties (= characteristics) to resist (= fight against) these forces. Equipment must be impact-resistant, fatigue-resistant, and tough (= difficult to break). Clothing must be wear-resistant, fit the body tightly and be aerodynamic (= able to move smoothly). Some materials should be rigid (= unbendable), others need to be flexible (= able to bend), or elastic (= able to change shape and return to their original shape). Some equipment must be hard (= able to cut, but not be cut by, other materials). For fast sports, equipment needs a high strength-to-weight ratio (combining strength with lightness).

Special materials are used for making modern sports equipment and clothing:

• **plastics** - these are light and can be moulded into shape. Examples: polycarbonate (goggles), polyurethane (footballs), and polystyrene (inside bike helmets)

• **fibres** - materials such as lycra and Kevlar are used for sports clothing.

• **composites** - these combine fibres and plastic and have a good strength-to-weight ratio. Examples: fibreglass (boats), graphite, and carbon-fibre (bicycle frames)

• **laminates** - these are formed from two or more layers of plastic or composite metals such as titanium, and aluminium, and alloys such as chrome-molybdenum (cro-moly) combine lightness, strength, and corrosion-resistance.

ЧАСТЬ III

Unit V APPROPRIATE TECHNOLOGY

I. Add to your active vocabulary:

1 appropriate technology	(экологически) чистая технология
2 expertise	a) человеческий опыт; b) экспертные знания; c) специальные, профессиональные знания; практический опыт; d) экспертиза
3 rural area	сельская местность; сельскохозяйственный район
4 wind pump	насос с ветряным двигателем
5 to maintain	a) поддерживать; b) содержать; c) сохранять; c) обслуживать
6 crankshaft	коленчатый вал, коленвал
7 to convert	преобразовывать; превращать
8 rotary	вращательный; роторный
9 blade	лопасть, лезвие
10 reciprocating	возвратно-поступательный
11 piston	поршень; клапан
12 clockwork	часовой механизм
13 step-up gearing	повышающая передача; мультипликатор
14 mains power	мощность, потребляемая от сети
15 diesel	дизель, дизельный двигатель
16 emergency	аварийная ситуация; авария; выход из строя
17 decibel	Децибел
18 domestic appliances	предметы домашнего обихода
19 induction stroke	ход [такт] впуска
20 compression stroke	1) ход [такт] сжатия 2) рабочий ход (амортизатора)
21 spark plug	свеча зажигания
22 power stroke	рабочий ход, рабочий такт
23 exhaust stroke	такт выпуска
24 exhaust gas	a) отходящий газ b) отработавший (выхлопной) газ
25 valve	клапан

II. Read and translate the text   APPROPRIATE

TECHNOLOGY, write annotation:

Appropriate technology is technology which uses locally available materials and expertise to provide inexpensive solutions to problems in countries in the developing world, particularly in poorer rural areas. The wind pump is a typical example - it is relatively simple to construct and maintain, and does not require fuel. It contains a simple mechanism, a crankshaft, which converts the rotary (round and round) movement of the blades into a reciprocating (up and down) movement which, in turn, is linked to the piston of a pump.

The clockwork radio is a more sophisticated example. It consists of a clockwork motor which drives a small generator. This produces enough power to run the radio. The step-up gears increase the speed of rotation of the motor. The radio is cheap to use because it does not need mains power or batteries, which can be very expensive. The clockwork computer described in the Gadget box uses the same form of power. Its cost is kept low because the computer is not advertised, and it uses open-source software, which is available free to anyone (unlike Microsoft, for example, which requires users to pay for a licence).

Portable generators combine an engine, usually diesel, with an electric generator. They provide power in emergencies or in areas where no mains power is available, but are often very noisy. Noise is measured in decibels (dB) - the higher the number, the noisier the machine. At home, the generator may be used to power domestic appliances such as kettles, freezers, washing machines, and air-conditioners. The amount of electricity they use is measured in kilowatts (kW). Lighting uses much less electricity.

Car engines are normally four-stroke. In a four-stroke petrol engine there is a cycle (or series) of events which is completed in four strokes (or movements) of the piston: on the induction stroke, the fuel is drawn into the cylinder, on the compression stroke, the fuel is compressed and ignited by the spark plug, on the power stroke, the piston is driven down the cylinder by the expanding gas from the burning fuel, on the exhaust stroke, the rising piston pushes the exhaust gas out of the engine.

Two-stroke engines are used in portable devices such as chainsaws. They can be used at any angle. Put simply, in the two-

stroke cycle, power and exhaust are combined in one stroke, compression and ignition in the other. There is no requirement for inlet and outlet valves for entry of the fuel or exit of the exhaust gas. This simplifies construction and reduces the cost of two-stroke engines. However, they are noisy and produce more pollution than four-stroke engines.

Unit VI Crime-fighting and security

1. Add to your active vocabulary:

1. criminal	злоумышленник, правонарушитель, преступник
2. to commit a crime	совершить преступление
3. fraud	обман; мошенничество, жульничество; подделка
4. to steal - stole – stolen	воровать, красть; похищать; грабить
5. threat of smt	угроза чего-то
6. identity	а)идентичность; подлинность; b) личность
7. to provide	давать, предоставлять; обеспечивать
8. to carry out one's duties	выполнять чьи-то обязанности
9. handcuffs	Наручники
10. to restrain	сдерживать, задерживать, подвергать заключению, изолировать
11. offender	Преступник
12. to prevent smb from doing smt	помешать, не дать кому-то сделать что-то
13. firearms	огнестрельное оружие
14. instead	вместо; взамен
15. to arm with smt	вооружать(ся) чем-то
16. to incapacitate	делать неспособным/непригодным; выводить из строя
17. to attach to, to fasten to	прикреплять, присоединять к
18. wire	проволока, электрический провод; телеграфный или телефонный провод
19. high voltage	высокое напряжение

20.	current	Ток
21.	to cause harm	приносить вред, убыток
22.	to insert	вставить, помещать
23.	offence	преступление, проступок, нарушение
24.	remote	дальний, далекий, отдаленный
25.	high resolution	высокое разрешение
26.	to trigger	приводить в действие
27.	iris	радужная оболочка (глаза)
28.	passage	прохождение, переход, проезд, проход; переезд
29.	to guard	охранять, защищать
30.	internal	внутренний

II . Read and translate the text Crime-fighting and security, write annotation:

Technology is becoming very important in crime-fighting and security. At the same time, criminals are finding new ways to use technology to commit crimes such as credit-card fraud (stealing money from other people's credit cards) and hacking (breaking into computer networks). The threat of terrorism has become greater in recent years. To combat this, devices have been developed to protect airports and other public places, and to check identities.

The pictures on p.34 show the equipment carried by a typical police officer in the UK. This special equipment provides protection against attack, and helps the officer to carry out his or her duties. Handcuffs are used to restrain offenders (prevent them from moving). Firearms or guns are not normally carried in the UK. Instead police are armed with non-lethal (non-deadly) weapons such as an extendable baton. This is manufactured from polycarbonate which can be used to produce very strong mouldings. Police may also use CS gas to incapacitate (or weaken) violent offenders. Some police forces are experimenting with Taser guns which fire a dart attached to electrical wires. Tasers deliver a high voltage but low current shock to the offender, which causes temporary paralysis but does not cause long-term harm.

Personal Identification Numbers (PIN) in combination with electronic chips inserted in credit cards (chip and PIN) have reduced card fraud. Global Positioning Systems (GPS), which can accurately identify a location to within a few metres using signals from earth-orbiting satellites, can be used to monitor   the movement of a tag fastened

to an offender's leg. This is much cheaper than sending people to prison for certain offences.

Other crime prevention measures include the use of remote sensors which can detect or measure changes in the environment, such as motion, shock, smoke, etc. High resolution cameras, like Flashcam, can be used to monitor an area continually. If the picture changes, the sensor (in this case a camera) triggers an alarm. The cameras can be rotated (turned) and tilted (moved upwards and downwards) by an operator, sometimes many kilometres away, using radio signals, so that a complete check of the surroundings can be made.

The science of biometrics, the ability to identify the individual by some unique property such as voice or face, is behind the development of iris scanning (which recognizes someone's eyes) and dynamic grip recognition (which recognizes the shape of a gun-owner's hand). Iris scanning is used to identify frequent-flying passengers on airlines to speed up their passage through security controls. The USA has introduced biometric passports to guard against identity fraud (the crime of stealing another person's identity).

Robots are used, in security, either because they can perform tasks more cheaply or without risk to human life. They are programmed to perform an activity when they receive a signal. The signal may come from sensors inside or outside the robot. In the case of Rotundus, the sensors (cameras, microphones, heat detectors, and smoke detectors) are all internal.