ПРИЛОЖЕНИЕ

**МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ**

ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
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КАФЕДРА «ИНОСТРАННЫХ ЯЗЫКОВ»

# ОЦЕНОЧНЫЕ МАТЕРИАЛЫ
**«Иностранный язык»**

Специальность

11.05.01 Радиоэлектронные системы и комплексы

Профиль

Радионавигационные системы и комплексы

Форма обучения — очная

Рязань, 2024 г.

# 1 ОБЩИЕ ПОЛОЖЕНИЯ

## 1. ОБЩИЕ ПОЛОЖЕНИЯ

Оценочные материалы – это совокупность учебно-методических материалов (контрольных заданий, описаний форм и процедур проверки), предназначенных для оценки качества освоения обучающимися данной дисциплины как части ОПОП.

Цель – оценить соответствие знаний, умений и владений, приобретенных обучающимся в процессе изучения дисциплины, целям и требованиям ОПОП в ходе проведения текущего контроля и промежуточной аттестации.

Основная задача – обеспечить оценку уровня сформированности общекультурных компетенций.

Контроль знаний обучающихся проводится в форме текущего контроля и промежуточной аттестации.

Текущий контроль успеваемости проводится с целью определения степени усвоения учебного материала, своевременного выявления и устранения недостатков в подготовке обучающихся и принятия необходимых мер по совершенствованию методики преподавания учебной дисциплины, организации работы обучающихся в ходе учебных занятий и самостоятельной работы, оказания им индивидуальной помощи.

Промежуточная аттестация проводится в форме экзамена – письменный и устный опрос по утвержденным вопросам, сформулированным с учетом содержания учебной дисциплины. В билет включается: письменное реферирование текста по специальности ≈5000 п.з., письменный перевод текста со словарем ≈1200 п.з., устный перевод без словаря и подготовки ≈2000 п.з., устная тема.

## 2. ОПИСАНИЕ ПОКАЗАТЕЛЕЙ И КРИТЕРИЕВ ОЦЕНИВАНИЯ КОМПЕТЕНЦИЙ

Сформированность каждой компетенции в рамках освоения данной дисциплины оценивается по трехуровневой шкале:

1) пороговый уровень является обязательным для всех обучающихся по завершении освоения дисциплины;

2) продвинутый уровень характеризуется превышением минимальных характеристик сформированности компетенций по завершении освоения дисциплины;

эталонный уровень характеризуется максимально возможной выраженностью компетенций и является

важным качественным ор ***Уровень освоения компетенций, формируемых дисциплиной:***

К оценке уровня знаний и практических умений и навыков рекомендуется предъявлять следующие общие требования.

**Оценка «Отлично»:**

глубокие и твердые знания материала программы дисциплины, понимание сущности и взаимосвязи рассматриваемых явлений (процессов);

полные, четкие, логически последовательные, правильные ответы на поставленные вопросы; умение выделять главное и делать выводы.

**Оценка «Хорошо»:**

достаточно полные и твёрдые знания программного материала дисциплины, правильное понимание сущности и взаимосвязи рассматриваемых явлений (процессов);

последовательные, правильные, конкретные, без существенных неточностей ответы на поставленные вопросы, свободное устранение замечаний о недостаточно полном освещении отдельных положений при постановке дополнительных вопросов.

**Оценка «Удовлетворительно»:**

знание основного программного материала дисциплины, понимание сущности и взаимосвязи основных рассматриваемых явлений (процессов);

понимание сущности обсуждаемых вопросов, правильные, без грубых ошибок ответы на поставленные вопросы, несущественные ошибки в ответах на дополнительные вопросы.

**Оценка «Неудовлетворительно»:**

отсутствие знаний значительной части программного материала дисциплины; неправильный ответ хотя бы на один из вопросов, существенные и грубые ошибки в ответах на дополнительные вопросы, недопонимание сущности излагаемых вопросов, неумение применять теоретические знания при решении практических задач, отсутствие навыков в обосновании выдвигаемых предложений и принимаемых решений.

При четырех вопросах в билете общая оценка выставляется следующим образом:

«отлично», если все оценки «отлично» или одна из них «хорошо»;

«хорошо», если не более одной оценки «удовлетворительно»;

«удовлетворительно», если две и более оценок «удовлетворительно»;

«неудовлетворительно», если одна оценка «неудовлетворительно», а остальные не выше чем «удовлетворительно» или две оценки «неудовлетворительно».

## 3. ПАСПОРТ ОЦЕНОЧНЫХ МАТЕРИАЛОВ ПО ДИСЦИПЛИНЕ

| **Контролируемые разделы (темы) дисциплины** | **Код контролируемой компетенции (или её части)** | **Вид, метод, форма оценочного мероприятия** |
|---|---|---|
| Общенаучная лексика. Высшее образование в России и за рубежом. Основы инженерного дела. История инженерного дела. Области инженерии. Моя будущая профессия – инженер. Знаменитые инженеры. | **ОПК-2**<br>**ОПК-9** | **Зачет** |
| Величайшие достижения в области инженерии. Будущее инженерии. Инженерная этика. Инженерное конструирование. Виды чертежей. Язык чисел. Компьютеры в инженерии. Техническое обслуживание. | **ОПК-2**<br>**ОПК-9** | **Зачет** |
| Радар. Основные функции радара. Радиолокационная система слежения. Допплеровская РЛС. Лазерная РЛС. Глобальная система позиционирования (GPS). | **ОПК-2**<br>**ОПК-9** | **Зачет** |
| Принципы работы GPS. Области приминения GPS. Инновации:ГЛОНАСС - прошлое, настоящее, будущее. Электромагнитные волны и основы работы антенн. Поляризация антенны. | **ОПК-2**<br>**ОПК-9** | **Экзамен** |

## 4.ТИПОВЫЕ КОНТРОЛЬНЫЕ ЗАДАНИЯ ИЛИ ИНЫЕ МАТЕРИАЛЫ

Контроль освоения компетенций ОК-5, ОК-6, ОК-7 осуществляется в течение четырех семестров в процессе выполнения студентами заданий (на практических занятиях и в процессе самостоятельной работы) с учетом соблюдения требований по содержанию, оформлению и срокам сдачи выполненных работ.

### *4.1. Промежуточная аттестация (экзамен)*

| ***Коды компетенций*** | ***Результаты освоения ОПОП***<br>***Содержание компетенций*** |
|---|---|

| | |
|---|---|
| ОПК-2 | готовность к коммуникации в устной и письменной формах на русском и иностранных языках для решения задач профессиональной деятельности |
| ОПК-9 | способность собирать, обрабатывать, анализировать и систематизировать научно-техническую информацию по тематике исследования, использовать достижения отечественной и зарубежной науки, техники и технологии |

***а) вариант типового билета по английскому языку:***

**ОПК-9 Способен собирать, обрабатывать, анализировать и систематизировать научно-техническую информацию по тематике исследования, использовать достижения отечественной и зарубежной науки, техники и технологии**

**Письменное реферирование текста по специальности ≈5000 п.з.**

**Microcontrollers**

A microcontroller (also microcontroller unit, MCU or μC) is a small computer on a single integrated circuit consisting of a relatively simple CPU combined with support functions such as a crystal oscillator, timers, watchdog, serial and analog I/O etc. Program memory in the form of NOR flash or OTP ROM is also often included on chip, as well as a, typically small, read/write memory.

Microcontrollers are designed for small applications. Thus, in contrast to the microprocessors used in personal computers and other high-performance applications, simplicity is emphasized. Some microcontrollers may operate at clock frequencies as low as 32kHz, as this is adequate for many typical applications, enabling low power consumption (milliwatts or microwatts). They will generally have the ability to retain functionality while waiting for an event such as a button press or other interrupt; power consumption while sleeping (CPU clock and most peripherals off) may be just nanowatts, making many of them well suited for long lasting battery applications.

Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, remote controls, office machines, appliances, power tools, and toys. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes.

Embedded design

The majority of computer systems in use today are embedded in other machinery, such as automobiles, telephones, appliances, and peripherals for computer systems. These are called embedded systems. While some embedded systems are very sophisticated, many have minimal requirements for memory and program length, with no operating system, and low software complexity. Typical input and output devices include switches, relays, solenoids, LEDs, small or custom LCD displays, radio frequency devices, and sensors for data such as temperature, humidity, light level etc. Embedded systems usually have no keyboard, screen, disks, printers, or other recognizable I/O devices of a personal computer, and may lack human interaction devices of any kind.

Interrupts

It is mandatory that micro-controllers provide real time response to events in the embedded system they are controlling. When certain events occur, an interrupt system can signal the processor to suspend processing the current instruction sequence and to begin an interrupt service routine (ISR). The ISR will perform any processing required based on the source of the interrupt before returning to the original instruction sequence. Possible interrupt sources are device dependent, and often include events such as an internal timer overflow, completing an analog to digital conversion, a logic level change on an input such as from a button being pressed, and data received on a communication link. Where power consumption is important as in battery operated devices, interrupts may also wake a micro-controller from a low power sleep state where the processor is halted until required to do something by a peripheral event.

Programs

Micro-controller programs must fit in the available on-chip program memory, since it would be costly to provide a system with external, expandable, memory. Compilers and assembly language are

used to turn high-level language programs into a compact machine code for storage in the microcontroller's memory. Depending on the device, the program memory may be permanent, read-only memory that can only be programmed at the factory, or program memory may be field-alterable flash or erasable read-only memory.

Other microcontroller features

Since embedded processors are usually used to control devices, they sometimes need to accept input from the device they are controlling. This is the purpose of the analog to digital converter. Since processors are built to interpret and process digital data, i.e. 1s and 0s, they won't be able to do anything with the analog signals that may be being sent to it by a device. So the analog to digital converter is used to convert the incoming data into a form that the processor can recognize. There is also a digital to analog converter that allows the processor to send data to the device it is controlling.

In addition to the converters, many embedded microprocessors include a variety of timers as well. One of the most common types of timers is the Programmable Interval Timer, or PIT for short. A PIT just counts down from some value to zero. Once it reaches zero, it sends an interrupt to the processor indicating that it has finished counting. This is useful for devices such as thermostats, which periodically test the temperature around them to see if they need to turn the air conditioner on, the heater on, etc.

Time Processing Unit or TPU for short is a sophisticated timer. In addition to counting down, the TPU can detect input events, generate output events, and perform other useful operations.

Dedicated Pulse Width Modulation (PWM) block makes it possible for the CPU to control power converters, resistive loads, motors, etc., without using lots of CPU resources in tight timer loops.

Universal Asynchronous Receiver/Transmitter (UART) block makes it possible to receive and transmit data over a serial line with very little load on the CPU.

For those wanting Ethernet one can use an external chip like Crystal Semiconductor CS8900A, Realtek RTL8019, or Microchip ENC 28J60. All of them allow easy interfacing with low pin count.

**ОПК-2 Готов к коммуникации в устной и письменной формах на русском и иностранных языках для решения задач профессиональной деятельности**

**Письменный перевод текста со словарем ≈1200 п.з.**

## Transistors

Today, when we refer to electronics, we are usually referring to things containing transistors. Transistors are devices that switch electric currents on and off or amplify electric currents. They use specially prepared substances to do this, and are used individually or in clusters of up to several million on integrated circuits. The transistor got its start in the 1940s when engineers began looking for a replacement for the electron tube, an earlier device for amplification and switching. The electron tube was based on the light bulb, so it was big, fragile, and created a lot of excess heat.

The inventors of the point-contact germanium transistor were John Bardeen, and Walter Brattain, who worked under William Shockley, at Bell Telephone Laboratories in New Jersey. In 1939, Brattain and Shockley began to work together on an electron tube replacement made of the chemical element germanium, a semiconductor. Germanium and other semiconductors had been used for many years in point-contact diodes, which consist of a small sample of semiconductor crystal with a permanent electrical connection at one end and an adjustable connection at the other. When the "cat's whisker" is adjusted correctly, the diode acts as a one-way valve for electric current. Brattain and Shockley believed that they could modify the diode so that they could regulate the current the same way the grid in an electron tube regulates current. The device did not work. Walter Brattain and John Bardeen returned to the idea in the middle 1940s. They found a new way to connect the germanium crystal to a circuit that allowed it to amplify current.

**Устный перевод без словаря и подготовки ≈2000 п.з.**

## The Internet

The conceptual foundation for creation of the Internet was largely created by three individuals

and a research conference, each of which changed the way we thought about technology by accurately predicting its future:

Vannevar Bush wrote the first visionary description of the potential uses for information technology with his description of the "memex" automated library system.

Norbert Wiener invented the field of Cybernetics, inspiring future researchers to focus on the use of technology to extend human capabilities.

The 1956 Dartmouth Artificial Intelligence conference crystallized the concept that technology was improving at an exponential rate, and provided the first serious consideration of the consequences.

Marshall McLuhan made the idea of a global village interconnected by an electronic nervous system part of our popular culture.

In 1957, the Soviet Union launched the first satellite, Sputnik I, triggering US President Dwight Eisenhower to create the ARPA agency to regain the technological lead in the arms race. ARPA appointed J.C.R. Licklider to head the new IPTO organization with a mandate to further the research of the SAGE program and help protect the US against a space-based nuclear attack. Licklider evangelized within the IPTO about the potential benefits of a country-wide communications network, influencing his successors to hire Lawrence Roberts to implement his vision.

Roberts led development of the network, based on the new idea of packet switching invented by Paul Baran at RAND, and a few years later by Donald Davies at the UK National Physical Laboratory. A special computer called an Interface Message Processor was developed to realize the design, and the ARPANET went live in early October, 1969. The first communications were between Leonard Kleinrock's research center at the University of California at Los Angeles, and Douglas Engelbart's center at the Stanford Research Institute.

The first networking protocol used on the ARPANET was the Network Control Program. In 1983, it was replaced with the TCP/IP protocol invented Wby Robert Kahn, Vinton Cerf, and others, which quickly became the most widely used network protocol in the world.

In 1990, the ARPANET was retired and transferred to the NSFNET. The NSFNET was soon connected to the CSNET, which linked Universities around North America, and then to the EUnet, which connected research facilities in Europe. Thanks in part to the NSF's enlightened management, and fueled by the popularity of the web, the use of the Internet exploded after 1990, causing the US Government to transfer management to independent organizations starting in 1995.

**Устная тема**

## Higher Education in Russia

The Russian Federation has had a long and distinguished history of education and science. The system of higher education has changed greatly over the last decade and this transformation process continues today. At present an educational institution can choose how to organize its educational process, select and hire its own staff, organize its own research, financial and economic activity to train up-to-date well-qualified specialists and to meet international standards of education.

Higher education is provided by public and non-state accredited higher education institutions. The majority of state institutes of higher education are regulated by the Ministry of Education of the Russian Federation. Some of them are regulated by other state Ministries, such as the Ministry of Health Care, the Ministry of International Affairs and others. At present, there are three basic kinds of higher education institutions.

Universities offer a wide spectrum of programs on all levels of education: undergraduate, graduate and post-graduate. Universities are leading research centers in fundamental fields that combine learning, teaching and research. There are 'classical' and 'technical' universities, which pay special attention to social sciences and humanities or natural and applied (engineering) sciences. Unofficial ratings also distinguish old 'classical' universities and 'new' universities, former pedagogical or technical institutes that have acquired their university status quite recently. Moscow State University is the oldest Russian university. It was founded on the initiative of M.V. Lomonosov in 1755 on Saint Tatyana's Day. And since that time Students' Day is celebrated on the 25$^{th}$ January.

Academies are higher educational institutions that provide higher education at all levels and conduct research mainly in one branch of science, technology or culture (Academy of Mining, Academy of Arts, etc.). They differ from universities only in that they restrict themselves to a single field.

Institutes are multi-discipline oriented higher educational institutions. They can be independent structural units, or part of a university or academy and usually specialize in one field. However pedagogical institutes are responsible for all spectrum of disciplines taught at schools.

Speaking about Private educational institutions, they offer degrees in non-engineering fields such as business, culture, sociology and religion. Many of the private educational institutions are fairly small and mainly have local importance in their respective region. As a rule they were opened for the professions that were demanded by the local labour market: lawyers, economists and accountants.

The Constitution and the Russian Federation Law on Education guarantee open and free access to higher education on a competitive basis. Applications are accepted from citizens of both sexes who have completed secondary education and passed a competitive entrance examination, which is given by each higher education institution on general subjects. The higher education admissions system presently is undergoing reform. To promote equity of higher education the Uniform State Exam was introduced. Soon all higher educational institutions will use this new system of uniform entrance exams and it will be possible to apply to several higher educational institutions at the same time.

The Law on Education also sets the quota of students, which are financed, from the Federal Budget. Therefore, a certain proportion of top scoring students are awarded free tuition and scholarships from the federal budget to cover their costs. However, the scholarship is very low and only covers minimum expenses. On top of the quotas described above, the universities are free to enroll students on a fee-paying basis and have the right to define the fee for their programme according to the market price and demand.

The academic year lasts ten months from the 1st September to the end of June of the following year. It is divided into two semesters. Almost all courses at the universities and institutes are taught by lectures, tutorials, group learning, project work and partly by computer assisted learning. Students' work during the course is assessed by means of essays, seminar work, reports on practical and project work. Twice a year, at the end of each term, students take final exams.

The government of the Russian Federation has approved three levels of study:

Level I generally takes 2 years of study. This level concentrates on compulsory fundamental courses in the given disciplines. Students holding a Level I qualification may either continue their studies or, if they choose, leave the institution with an intermediate diploma.

Level II takes additional two years leading to a Bachelor's degree. Consequently, this first academic degree entails four years of study.

Level III represents an educational level for the students who receive the Diploma of higher education in special fields after five years of study or the Master's degree after 6 years of study.

After the graduation from the higher educational institutions students can enter the post-graduate course. There are two levels of doctoral scientific degrees: The Candidate of Sciences and The Doctor of Sciences. The Candidate of Sciences is granted after at least a three-year period of guided research and public defense of a thesis. The Doctor of Sciences is the highest academic degree awarded in Russia. The degree requires the completion of a dissertation that includes results of fundamental scientific or applied significance and the content of the dissertation must be based on the original research.

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