Professional Education Competence Centre
Riga Technical College

First Level of Higher Professional Education

Telecommunications

Study Programm Self-assessment Statement

Program Director: assist.prof. Ziedīte Šmite

Riga

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INTRODUCTION

The study program (curriculum) submitted for the assessment is the first level of higher professional education program in Telecommunications with the acquired qualification *Telecommunications Specialist* implemented at Professional Education Competence Centre *Riga Technical College* by Information Technologies and Communication Department.

.The study program was accredited on 15 September, 2010 (the act of the Accreditation Commission Nr.035-1919) and is valid until 31 December, 2016.

1. Quality

1.1 Study Program Aims and Tasks

The **general aims** of the study program are to provide the first level of higher professional education and prepare highly qualified specialists for professional activities in telecommunications. Moreover, the program is to ensure the following:

- the correspondence of the acquired theoretical and practical knowledge, skills, abilities and professional attitudes to the profession standard and labour market requirements;
- the correspondence of the standard of the first level of higher professional education;
- the correspondence of the fourth professional qualification level.

  Telecommunication specialist may work in various communication organisations, enterprises and companies as well as in other branch organisations.

The specific aims of the first level of higher professional education is the achievement of such knowledge, skills, abilities and attitudes.

The enabling objectives and tasks for the telecommuniation specialist are:

- to formulate the requirements for equipment exploitation parameters;
- to formulate the requirements for equipment technical parameters;
- to conduct the analysis of the overall equipment exploitation conditions;
- to conduct the analysis of the conformance of the equipment to the existing standards and regulations;
- to select the equipment considering the economic factors;
- to estimate fixed and variable costs related to the equipment launch;
- to assemble and install the equipment in accordance with technical documentation requirements;
- to ensure the conformance to the existing standards and other guidelines;
- to conduct equipment launch and adjustment operations;
- to evaluate equipment functional parameters;
- to draw up the equipment launch and adjustment operations documentation;
- to acquire equipment exploitation technical documentation;
- to ensure exploitation modes and conditions in accordance with the requirements of technical documentation;
- to follow the standards and other guidelines requirements in the exploitation process;
- to determine the controllable parameters of the equipment in the process of exploitation and its control intervals;

- to analyse the requirements of the testing equipment
- to acquire the methodology of the control of equipment parameters;
- to conduct equipment maintenance on a regular basis;
- to diagnose the reasons of equipment breakdowns and failures;
- to estimate the costs of equipment repair;
- to repair the equipment;
- to analyse the reasons of equipment breakdowns and failures and conduct necessary preventive actions;
- to do the preliminary analysis of equipment upgrade and usability;
- to consider the technical issues for the equipment upgrade;
- to estimate the costs of the equipment upgrade;
- to evaluate the conformance of the equipment upgrade to the existing standards and other guidelines;
- to do the equipment upgrade;
- to solve the problems related to the corrective actions of the exploitation process of the upgraded equipment.

The study results correspond to the set aims and enabling objectives.

Students' enrollment in the program started on September 1, 2002. The number of graduates constituted **22** students in the academic year 2004/2005, **22** students in the year 2005/2006, **12** students in 2006/2007, **27** students in 2007/2008, **52** students in 2008/2009, **34** students in 2009/2010, and **21** students in 2010/2011 accordingly. The total number of the graduates during the study program operation consituted **190** specialists possessing higher professional education in telecommunications including **52** specialists of the branch leading company *Lattelecom*, **9** employees of the company *Citrus Solutions*, as well as the specialists from other telecommunications companies.

1.2 Study Content and Organisation

The study program of Professional Education Competence Centre *Riga Technical College* (hereafter college) corresponds to the ***Telecommunications Branch Profession Standard***, which was designed simultaneously with the study program in cooperation with the leading specialists in telecommunications in Latvia. Both the study program of the first level of higher professional education and the profession standard were further reviewed in leading telecommunication companies in Latvia and positive evaluation was provided.

The study program under consideration corresponds to the requirements of ***State Standard of the First Level of Higher Professional Education.***

The study program consists of 100 credit points (hereafter CP) with the implementation period being two and a half years for full-time studies. One credit point (CP) corresponds to 40 hours of studies a week, i.e.

- 20 contact hour and 20 hours of independent studies for full-time students;

The study program involves:

- general education study courses,
- domain specific study courses (compulsory and elective),
- internship,
- the design and defense of the qualification paper.

General education compulsory study courses ensure knowledge acquisition for the first level of higher professional education, and they are:

- Communication study courses (including a foreign language);
- Mathematics;
- Entrepreneurship study courses;
- Social sciences.

Domain specific compulsory and elective study courses are common for the branch or related professions.

Professional study courses correspond to the specific profession.

State Standard of the First Level of Higher Professional Education determines the obligatory content of the study program. The **structure** of the study program is formed accordingly:

- theoretical studies 75 CP (75 %);
- internship 16 CP (16 %);
- qualification paper 9 CP (9 %);

Theoretical studies involve contact hours and autonomous learning (individual studies). **Contact hours** are managed by a responsible member of academic personnel and constitute 59 percent from the overall amount of the theoretical studies. Contact hours are realised in the mode of lectures, seminars, laboratory and practical assignments as well as tutorials. During the implementation of the study program the students are provided with an individual approach and continuous feedback, which is achieved by holding tutorials and information exchange via e-mail. **Internship** is a study form, which is conducted at a real work place within a company according to the internship program. The design and the defense of the qualification paper

assure students' professional qualification. Students who acquire the professional education program are required to combine theoretical knowledge and practical skills. The study program under consideration includes four types of practice and internship:

- electrical communication equipment installation practice (held in the 1st semester (2CP));
- Computer application practice (held in the 2nd semester (2CP));
- Specialty internship (held in the 4th semester (8CP));
- Qualification internship (held in the 5th semester (4CP));

Qualification paper is the confirmation of a student's competence to hold the qualification.

1.3 Studies and Evaluation of Knowledge

The studies are determined by the regulations of Riga Technical College, the study program (curriculum), the study plan, study course programs (syllabus) and the study process schedule. The study program and the study plan state the acquired study courses, their mode, length, distribution in years and sequence. Study process schedule determines the terms of the academic year. Study course programs (syllabi) define the content of studies, practice and internship. The study program is acquired through theoretical and practical study modes, internship and autonomous learning.

The **basic study methods** are lectures, seminars, practical assignments (workshops), laboratory assignments, tests, study excursions and autonomous learning. Learning autonomously the students acquire the material independently- working with professional literature and periodicals, searching for the information in the world wide web, designing course reports and term papers, completing analytical tasks.

The aim of the term paper design is to evaluate students' knowledge and skills in a certain study course as well as facilitate the development argumentation skills. The term paper deals with solving specific problems under the supervision and control of the appointed academic advisor. The students are offered to choose the themes of course reports and term papers themselves with the consequent approval by the academic advisor. Upon term paper submission the academic advisor prepares a reference, evaluating the topicality and significance of the theme, the correspondence of the content to the set aims and objectives, the quality of formatting and adherence to conventions, the nature of the paper (creative or descriptive), the justification of conclusions and suggestions. The term paper is defended and evaluated according to the 10 points system.

Upon successful completion of the theoretical and practical studies as well as internship assignments in the 5th semester, the student is required to defend the qualification paper. It proposes the solutions to the problems in telecommunications by professional application of the acquired knowledge and skills.

The stages of the development of the qualification paper are as follows:

- Formulating the task;
- Analysis of the problem and choosing a possible solution;
- Practical implementation of the task applying efficient solution technologies;
- Assessment of the acquired results.

The design and defense of the qualification paper demonstrate the compliance of a student's sufficient theoretical knowledge and practical skills with the qualification requirements. The students are allowed to choose the topic for the qualification paper themselves.

The lectures are organized for each group separately or sometimes combining several groups together. One class lasts for 90 minutes with a 5 minutes break in between.

The **facilities** to ensure efficient study program acquisition are classrooms, labs, and computer study rooms with the required equipment.

The **psychological environment** of the college is created by the students, academic personnel and other employees. This is the environment where the students would feel psychologically comfortable, are encouraged to express their opinion freely, obtain the required psychological support and methodological help from the academic personnel.

The **assessment** is the procedure to determine students' knowledge, skills and attitudes. The common principles are the following:

- Weighted average of the positive achievements;
- Compulsory assessment;
- Clear and accessible requirements;
- A variety of assessment methods;
- The relevance of the assessment.

Students' knowledge is assessed in all kinds of classes, term papers, tests and exams. Upon each course commencement the students are familiarised with the study aims, objectives and learning outcomes as well as assessment criteria. The knowledge is assessed applying 10 points system or granting a pass.

Exam is students' knowledge and skills written or oral assessment applying 10 points system, with minimal grade being four.

It means:

- Very high level of acquisition: 10 (with distinction), 9 (excellent);
- High level of acquisition: 8 (very good), 7 (good);
- Average level of acquisition: 6 (almost good), 5 (average), 4 (almost average);
- Low/ Insufficient level of acquisition: 3 (weak), 2 (very weak), 2 (extremely weak).

A **test** is students' knowledge and skills written or oral assessment granting a *pass* or a *fail*.

The assessment is stated in the study program and its mode (written or oral) is determined by the academic personnel in cooperation with the program director. The student is granted credit points for the study course acquisition, if he have received a *pass* or a mark not lower than 4 (almost average).

The qualification paper is assessed applying 10 points system with the lowest sufficient mark being 4. The defense of the paper takes place at College, considering the following regulations:

- The defense takes place at the meeting of the state qualification committee.
- The committee consists of not less than five members;
- The members of the committee are the representatives of telecommunication branch companies and professional bodies as well as College academic personnel;
- The chairperson and not less than 50 per cent of the committee members are the representatives of telecommunication branch companies and professional bodies;
- the committee members and the chairperson are approved by he College Board.

The **diploma** granting the first level of higher professional education is issued to the students who:

- have successfully met the study program requirements
- have successfully defended the qualification paper.

The study program is assessmed by superior educational institutions, the representatives of employers' organisations and employers' association.

Considering the analysis of internal audit, students' knowledge, skills, and professional attitude corresponds to the requirements of the labour market.

The syllabi are evaluated and approved of by program directors and deputy director in study and research. Academic personnel's quality of work is evaluated by the study program director and College administrative personnel.

The study program is expected to be reviewed and updated on a regular basis in accordance with labour market needs in telecommunication industry.

The enrolment is organised in accordance with matriculation regulations, which involve enrolment regulations for Latvian higher education institutions approved by the Ministry of Education and Science the Law of Higher Education Institutions clauses 45, 46 and 83 and additional RTC requirements approved by RTC Board.

To ensure the achievement of the learning outcomes of the study program in due time and motivation increase, the students are provided with academic personnel's tutorials. The time is available at College website www.rtk.lv.

1.4 Study Provision and Management

The academic personnel is a crucial factor working with students. Their work significantly reflects study quality. The personnel involved in the implementation of the study is required to possess the appropriate skills and experience to transfer their knowledge and skills to students in all study courses. The academic personnel may be subdivided into three main groups:

- general education study courses;
- domain specific study courses;
- profession study courses.

The responsibilities of the academic personnel comprise:

- teaching study courses at a methodologically high level covering the study plan and program;
- the monitoring and control of knowledge and skills and the analysis of learning outcomes;
- the update of the facilities necessary for the study process as well as their rational and accurate use;
- methodolocical activities in accordance with College Action plan;
- provide tutorials in the appointed time;
- following College internal regulations;
- the continuous enhancement of professional and pedagogical qualifications as well as scientific research skills.

Telecommunications is a rapidly developing branch. Due to frequent crucial chanages the academic personnel have to follow them. The professional development may be achieved differently:

- more experienced personnel designed more complicated courses whereas younger or less experienced colleagues develop simpler courses;
- reviewing latest professional literature and acquiring new software on a regular basis. College library has been supplemented with latest technical literature in telecommunications. The information can be obtained:
  - from the Internet
  - observing colleagues' lessons;
  - cooperating with colleagues from other education institutions;
  - cooperating with employers.

To detemine the mutual relations of administrative, academic personnel and students the Code of Ethics was designed by the lecturer Evija Tože in 2011. It is based on the Document of European School Council, the Law of Education, Latvian Administrative Code, and College Internal Regulations. It is available for all students, academic personnel and college employees at the library, from the group's monitor (from academic personnel) and deputy director.

The aim of the Code of Ethics is to facilitate students and academic personnel as well as other College personnelto honest, trustworthy, reliable, responsible and conscientious in completing their direct responsibilities following ethical princiles in mutual cmmunication and behaviour.[1]

RTC Regulations and structure determine the operation of RTC board, involving students' representatives delegated by RTC Students' board. Therefore, the students are included in the decision making process at college on the whole. The students of the study program *Telecommunications* are represented in the Students' Council and participate in solving actual issues.

1.5 Academic Personnel and Students Research (Creative) Activities

The research activity of the academic personnel is related to participation in scientific and research conferences and seminars,publications in scientific journals and other periodicals.

Academic personnel participate in the design of the study program, study courses, design methodological materials as well as conduct research work. A positive trend that should be noted

[1] Toze E. „The Implementation of the Code of Ethics into Academic Personnel', Employees', Pupils' and Students' Work"

is *International Scientifically Practical Conferences Higher Professional Education in Theory and Practice* organized at College where the academic personnel of Telecommunications program participate as well.

The most notable research results of the academic personnel are the following:

1. Participation in conferences, seminars and publications:

- Z.Smite „ *The Design and Evaluation of an Enhanced Optical Multiplexing System in Students' Term Papers*", RTC, Scientific Articles, 8th Issue;
- Z.Smite „*Subscriber's Optical Fibre Access to Communication Services*", RTC, Scientific articles, 9th Issue ;
- D.Cimermane „*The Classification and Description of Wires in Communication Technologies*" RTC, Scientific Articles, 8th Volume .

2. Participation in conferences, seminars and courses:

Z.Smite, D.Cimermane, Riga Technical University, *Innovations and Modern Technologies Conference,* 19.09.208 and 20.012009 on

1. The Analysis and Modelling of the Network of Intellectual Transport System Wireless Data Transmission;
2. The Research of Traffic Management „Strand to the House" in the Optical Communication System;
3. The Design and Evaluation of an Enhanced Optical Multiplexing System;
4. The Use of Fi Function in Latest Data Transmission Systems.

Z.Smite un D.Cimermane, Riga Technical University, *Innovations and Modern Technologies Conference* 23.02.2010 on:

1. The Use of Fi Function in Latest Data Transmission Systems;
2. The Research of Spectral Broadband Passive Optical Network Implementation

Z.Smite un I.Traulins, *Lattelecom Ltd*, a course *Telecommunications Technologies*, 18-19.03.2008.

- I.Traulins, Baltic Computer Academy, a course *New Generation Network-NGN*,12.10.2008.

3.Participation in the projects implemented by Information Technologies and Communications department:

- Bilateral Cooperation Project with Lapland Technical College in Finland in 2002-2011;

- Academic personnel has acquired Riga Technical University Humanities Institute professional development training program „The Enhancement of the Academic Personnel Competences in Pedagody and IT" (ESF Co-funded project) and obtained the relevant certificates.

The aim of the first level of higher professional education is to implement in-depth language acquisition in a particular branch, thus, the primary attention is attracted to professional readiness. Students' research activities occur mainly during the process of term paper and qualification paper design, providing multiple solutions, comparing those, selecting and justifying the most relevant one.

To familiarise the students with a higher level research activities and facilitate their interest, second and third year students are entitled to participate in College International Scientifically Practical Conference *Higher Professional Education in Theory and Practice.*

They have prepared conference reports on the following modern telecommunication topics for the 6th issue:

- *The Design of Digital Transmittal Systems in Local Area Networks.* The student Kristine Kurusa;
- *The Detection of the Transmittal Distance of SDH Optical Loop.* The student Stanislav Demencuk;
- *Optical Fibre Technologies in Latvian Mobile Telephone Networks.* The student Gatis Puisans.

All the abovementioned specialists were encouraged to participate in the research project and consulted by the assist. professor of the department Ziedite Smite.

Student's Stanislav Demencuk participation in the qualification and graduation paper competition organised by JSC *Latvenergo* in 2008 is notable since the experts' committee granted a recognition prize for his qualification paper *The Organisation of Telecommunication Networks at a Biodiesel Plant*.

Students actively participated in Riga Technical University *Innovations and Modern Technologies Conference*, 19.09.208 and 20.012009 on

1. The Analysis and Modelling of the Network of Intellectual Transport System Wireless Data Transmission;
2. The Research of Traffic Management „Strand to the House" in the Optical Communication System;
5. The Design and Evaluation of an Enhanced Optical Multiplexing System;
6. The Use of Fi Function in Latest Data Transmission Systems.

23.02.2010 on:

1. The Use of Fi Function in Latest Data Transmission Systems;
2. The Research of Spectral Broadband Passive Optical Network Implementation

1.6 Quality Assurance and Guaranties

The internal quality system of the higher professional education study program *Telecommunications* has been established basing on study quality monitoring and control systems. It is divided into seven essential aspects:

- the correspondence of the study program sto College Development Strategy;
- academic personnel work quality
- study program quality
- the quality of cooperation with applicants and graduates
- study process quality
- the quality of infrastructure and technical facilities
- the quality of finance and business activity.

Study program and study process quality are considered to be the most significant within the framework of the study program *Telecommunications*.

The study program quality is evaluated considering:

- the correspondence of the study programs to College Development Strategy;
- the correspondence of the study programs to the standards of Latvian education and profession as well as other normative acts;
- following democracy principle in tha process of program management and in the mutual relations of students' and academic personnel;
- study program methodological, informative and physical facilities;
- annual study program self-assessment results.
- ikgadējiem studiju programmu pašnovērtējumiem.

The following aspects are evaluated in in the study program quality assurance:

- latest methodology of the study process as well as the use of computers, multimedia and the Internet;
- study motivation;
- the objectivity of knowledge and skills and the application of the results for the improvement of the study process;

- the involvement of the students into research activities;
- Study load, the organisation of autonomous learning, tutorials availability, access to information, the content of the study course, the arrangement and order of study courses as well as their consistency;
- Students' feeling at college.

The study program director is responsible for the implementation of the study program. The changes and amendments may be encouraged by the study program director', academic personnel', and students' suggestions. They have to be approved by the college board.The study pocess during the study program implementation is discussed during the department meeting. Program director observes some lectures and seminars at random and analyses it with the responsible academic personnel involved. The questionnaires about the study process are conducted and administered at the end of the academic year, the results of which are discussed during the department meeting.

Students in the academic years 2008/2009, 2009/2010, 2010/2011.
The total number of students within the program: 278 students.

The number of students enrolled for state budget finance:
2008/2009 **102** students

2009/2010 **76** students

2010/2011 **65** students

The number of students obtaining qualification:

2008/2009 **52** students

2009/2010 **34** students

2010/2011 **21** students

The results of state centralised exams of the enrolled students:

	2008/2009	**2009/2010**	**2010/2011**
A	-	-	-
B	1	5	4
C	13	24	10
D	25	27	19
E	20	4	13
F	1	-	-

The academic personnel of the study program:
2008/2009 academic personnel **22**
2009/2010 academic personnel **22**
2010/2011 academic personnel **22**

2. Resources

2.1 Study Program Aims and Tasks

The academic personnel evaluates the program resources as appropriate for achieving the set aims of the study program. In order to determine students' attitude to the study program and its implementation, first, second and third year students were surveyed. The results of the survey confirm the positive evaluation of the study program.

2.2 Study Content and Organisation

No	**Name, surname**	**Academic position**	**Degree**	Permanent (p) / temporary (t) election	**Delivered Study Course**
1.	Vija Grava	lecturer	Master's	p	* Mathematics 6 CP
2.	Inta Klotiņa	assist. professor	Doktors	p	* Physics 3 CP
3.	Jana Kuzmina	assist. professor	Master's, 3rd Year Doctoral Student at LU	t	* English 3 CP
4.	Iveta Ulmane	assist. professor	Master's, RTU Doctoral Student	p	* Entrepreneurial Economics 3 CP
5.	Kristīne Rūtiņa	assistant	Bachelor, RTU Master's student	p	* Latvia and Europe 1 CP
6.	Sandra Stūrīte	assistant	Master's	p	* Labour, Environment, and Civil Protection 1 CP
7.	Oļģerts Dreimanis	assistant	Higher professional	p	* Labour, Environment, and Civil Protection 1CP
8.	Lilita Jonāne	assist. professor	Master's	p	* Corporate Psychology 2 CP

9.	Ziedīte Šmite	assist. professor	Master's	p	* Introduction to Specialty 1 CP * Transmittal Systems 5 CP * Optical Fiber Data Transfer Systems 4 CP * Telecommunication Networks Design 5 CP * Communication System Technical Maintenance 2 CP
10.	Baļule Rasma	lecturer	Master's	P	* Electrical Equipment 4 CP
11.	Veronika Iesmiņa	assistant	Master's	P	* Engineering Graphics 1 CP
12.	Andrejs Veide	lecturer	Master's	P	* Electronics and Microelectronics 4 CP
13.	Jānis Ogsts	assistant	Master's	P	* Electrical Communication Theory 3 CP
14.	Diāna Cimermane	lecturer	Bachelor	P	* Teletraffic Theory 2 CP * Communication Lines 4 CP * Data Transfer 4 CP
15.	Imants Trauliņš	lecturer	Master's	P	* Telecommunication Measurements 2 CP * Power Supply Appliances of Communication 1 CP * Mobile Communication Systems 4 CP
16.	Jānis Brants	assistant	Master's	P	* Telecommunication Hubs 2CP * Digital Commutation Systems 5 CP
17.	Andris Jaunkalns	assistant	Bachelor	p	* IT Telecommunication 2 CP
18.	Valentīns Dernovs	assistant	Higher professional	p	* Electrical Communication Equipment Installation Practice/ Internship2CP
19.	Viktors Zaičenko	assistant	Master's	p	* Electrical Communication Equipment Installation Practice/ Internship 2 CP

To ensure qualitative acquisition of the professional study programme, a lot of attention is paid to internship, its organization, management and control. Internship is an integral part of the study program Telecommunications, which ensures a link with the domain specific enterprises. Internship is a study mode run at a work place in accordance to the practice program. It can be organised at an enterprise or at college. Internship places are provided by both college authorities and students. The department approves of the head of the group's practice or internship from the

academic personnel. Upon the commencement of the internship, the students receive the internship program which contains the content, the documentation to be submitted upon completion and assessment criteria. The head of the practice or internship gives individual assignments, provides tutorials and controls the overall process. Every student also has the head of internship from company employees at the workplace. At the end of the internship the student submits a report and a reference from the head of the internship at the workplace to the department. The execution of the internship program is monitored by the committee appointed by the head of the department. The assessment is *passed* or *failed* which is granted by both heads of internship at college and at a workplace.

The employers are from the following telecommunication enterprises, organizations and companies:

Lattelecom Ltd; Citrus Solutions Ltd; Latvijas Mobilais Telefons Ltd TELE 2 Ltd; The Ministry of Internal Affairs, Information Centre Stationary Communication Provision Department, Informācijas centra Stacionāro komunikāciju nodrošinājuma nodaļa ; JSC SAF TEHNIKA; JSC Telekom Baltija; Alkatel Baltic Ltd; IZZI Ltd;Bezvadu interneta tīkli Ltd; Latvijas Energoceltnieks Ltd; State JSC Latvenergo Telekomunikācijas ; CT Komunikācijas Ltd; Belss Ltd; GP Systems Ltd; OPTRON Ltd; Lain Net Ltd; Retarl Security Ltd; Ekstracom Ltd; SPX Ltd; Multiplekss AG Ltd; Latvijas tīkli Ltd; ATK serviss Ltd; THE LIGHT Ltd (Līvāni); Televideo tīkls Ltd; Optimplus Ltd; Daina – EL Ltd.

All the abovementioned internship places are students'prospective workplaces.

2.3 Studies and Evaluation of Knowledge

The facilities correspond to modern technologies requirements comprising computers, multimedia, and the Internet.

Facilities in Computer Classrooms:

Students have access to 9 computer classrooms equipped with 165 computers. Most of them were obtained during the implementation of bilateral project „Swedish- Latvian bilateral project „Computer room" (2003- 2009) as used working equipment with Intel Pentium and Celeron processors.

In 2012 two new computer classrooms with 50 new computers for students and a computerised workplace for the academic personnel will be established. The current computers in the computer classrooms are connected to the LAN (except three computer classrooms). Linux

operating system is used for network administration, workstations have Windows XP. It enables better user information storage, protection and internet access. Every student has 120Mb for information storage in the network server. The information is stored throughout all the study period. Students' workstations contain all necesary software installed. The student can access the information entering his login and password. There are a computer with the Internet connection and an OH projector at each academic personnel's work place in 5 classrooms. The students may send the information stored at college computers to external computers for autonomous learning using email.

2.4 Study Provision and Management

The following **Riga Technical College structural units** are involved in the implementation of the study program:

- *Information Technologies and Communication Department;*
- *Power Engineering Department;*
- *General Studies, Entrepreneurship and Management Department;*
- *Transport and Metalwork Department*

All the abovementioned departments participate in the implementation of the study program, delivering the relevant study courses theoretical and practical parts.

- To realise empirical studies and internship Riga Technical College the following units and laboratories are involved**:**
  - **Information Technologies and Communication Department:**

1. Telecommunications measurement laboratory;
2. Communications lines laboratory;
3. Digital commutation systems laboratory;
4. Transmittal systems laboratory;
5. Data transmittal laboratory;
6. electronics and microelectronics laboratory;
7. Computer classrooms.

- **Power Engineering Department:**

1. Electrical equipment laboratory;

2. Labour protection classroom.

- **General Studies, Entrepreneurship and Management Department:**

1. Math classroom with an interactive whiteboard;
2. Physics classroom;
3. Economics and the Basics of Entrepreneurship classroom.

- **Transport and Metalwork Department:**

4. Engineering Graphics classroom

To realise empirical studies and internship Riga Technical College **Study Practice and Production Department** is involved**.**

The following assisting personnel facilitates the implementation of the study program:

- Study Department
- Study Practice and Production Department
- Research and Methodological Development Department
- IT Support Department
- Study Process Development and Business Activity Department
- Library
- Study Information Centre
- Administrative office
- Accounting Department
- Dorms

All the abovementioned structural units participate in the implementation of the study program, ensuring a consistent theoretical and empirical study process and well as everyday routine.

The library plays a significant role in the provision of the study process at Riga technical College. Its aim is provide the students and the academic personnel with the required study and scientific literature. The facilities of the library are being renewed at the moments. Department consultants participate in ordering the materials and the periodicals for the library. Latest literature in telecommunications has been obtained for students' and academic personnel's in the department.

Research and Methodological Development Department establishes the study program methodological work, comprising methodological material design, multiplying and spreading among students for their study purposes.

To ensure study program implementation the following facilities have been equipped:

- 4 classrooms with 30 places for theoretical knowledge acquisition;
- 1 classroom for organising practical workshops;
- 5 specialised telecommunications technologies labs.

Data transmittal lab has been equipped with computers and fax/modem devices. Internet connection has been provided in the places where experimental study network is used and there are facilities to make various networks topology connection schemes, install network cards connections with various types of cables to analyse network load.

Telecommunications measurement laboratory contains 10 workplaces equipped with high frequency and low frequency generators, digital voltmeters, broadband and selective level meters, oscillographs, frequency gauges, non-linear distortion meters, phase shift meters, spectrum analysers, universal line meters and cable locators.

Transmittal systems laboratory is equipped with digital transmittal systems device in full set, i.e. 2 end stations, 30 tone frequency channels with intermediary stations, as well as as well as specialised measurement equipment transmittal system for channels and group paths parameter measurement: quantization noise meters, synchronisation devices testing board, line regenerators testing board, broadband and selective level meters a.o. Laboratory equipment contains various models- channel node imitators.

Digital commutation systems laboratory is equipped with digital commutation exchanges, various computerised service equipment for modelling various types of connection and breakdowns. Lab equipment includes digital commutation cassettes with typical changeable elements, digital commutation exchange for 50 subscribers as well as various telecommunication terminals devices.

Communication lines laboratory is equipped with computer network cross devices and accessories, cable connectors, assembling and testing instruments.

Electronics and microelectronics is equipped with laboratory stands and models**:** BISP and BIS stands, microcontroller testing stands, study models *Digital IMS***,** study models *Operations Amplifiers*, semiconductors components, photovoltaic elements research stands. It also contains all necessary measurement equipment: electronic voltmeters, oscillographs a.o.

All the study stands are used to acquire telecommunications technologies. To provide laboratory methodological documentation 3 CANON photocopiers are used.

Telecommunications labs receive donations from leading branch companies: **Lattelecom Ltd, Citrus Solutions Ltd and Latvian Mobile Telephone.**

The equipment appears in annual self-assessment statements as infrastructure expansion.

In the academic year 2010/2011 the infrastructure of the study program Telecommunications was supplied with the new generation line tester ***ARGUS 145 PLUS,*** ISDN, ADSL, SHDSL, VoIP, Ethernet and IP line testing as well as digital multimeters.

The international project No 3DP/3.1.2.1.1/09/1P1A/VIAA/036 *The Modernisation of Venues and Equipment at Riga Technical College for Quality Enhancement* was implemented. „**Rīgas**

2.5 Academic Personnel and Students Research (Creative) Activities

The training, development and renewal policy of the academic personnel is implemented, facilitating their continuous improvements, including motivation activities to participate in scientific research work, seminars, conferences and courses.

Students are provided with the access of telecommunication laboratories equipment, computers, audio/video means, classroom facilities which have been indicated in section 2.4.

Scientific and research work is encouraged at College. The academic personnel apply for the participation in international scientifically practical conference *The First Level of Higher Professional Educationin Theory and Practice* to publish their research activities as well as to project preparation and implementation. The participants of the conference are both the academic personnel and students. They may also participate in the events organised by other Latvian and foreign educational institutions. The College ensures the publication of methodological materials, study books and handouts. Most representatives of the academic personnel are the working specialists in their domain which is a crucial fact worth mentioning.

2.6 Quality Assurance and Guaranties

Financial resources for ensuring the implementation of the study programme are seen in R.2.1., R.2.2., and R.2.3. and their usage is controlled annually by RTC Audit Commission which statements are publicized in annual reports.

3 Sustainability

3.1 Study Program Aims and Tasks

Academic positions are taken by the academic personnel in accordance with the normative acts of the Republic of Latvia as a result of elections. The main requirements of the candidates comprise education, qualification, academic and scientific degrees, the amount of working years, professional development, methodological materials, and the results of scientific research work.

The training, development and renewal policy of the academic personnel is implemented, facilitating their continuous improvements, including discussions, consultations in the department meetings and on a daily basis, motivation activities to participate in scientific research work, seminars, conferences and courses.

College developments policy with reference to personnel foresees:

- to improve the working conditions of the academic personnel;
- to facilitate life-long learning of the existing academic personnel in Master's and Doctoral programs, attending courses and seminars;
- to facilitate skills improvement of the academic personnel;
- to attract highly qualified specialists- practicioners with extensive work experience to conduct classes;
- to attract academic personnel with the relevant academic degrees;
- to conduct research activities with regards to lecturers' work quality, observing classes, conducting students' surveys, checking the methodological material and its quality;
- to maintain contacts and cooperation with the academic personnel of other educational institutions and colleges;
- to facilitate the acquisition of foreign languages;
- to initiate cooperation projects with foreign educational institutions with regards to personnel training;
- to align the content of term papers and qualification papers with the real needs of enterprises;
- to facilitate enterprise direct financial support for the support of the study program.

3.2 Study Content and Organisation

The quality of the study program and its further development are closely connected with employers who are involved in the development of the study program, profession standard and profession classificator actualisation process.

The study program has to be regularly reviewed in compliance with the demands of the labour market in telecommunications. At the end of each academic year the implementation process as well as its correspondence to the labour market requirements are evaluated.

Regular consultations with the representatives of Latvian Telecommunication Association are held to solve the issue with qualification.

In the academic year 2006/2007 the number of graduates could not satisfy the demend of the labour market. The suggestion of Telecommunications Association and leading telecommunication enterprises was to reduce the duration of the study program implementation accordingly:

- 2.5 years for full-time students;
- 3 years for part-time students.

The telecommunications industry is currently characterised with the considerable growth of stored information and the variaty of latest telecommunications technologies, so the specialisation necessity in a specific work place is obviously expressed, since a graduate cannot acquire all possible latest trends and orientate in a versatile environment of employment.

The task of the study program is ensure that the graduate is adapted in any branch enterprise in a sufficiently short period of time.

The amount of the study program is 100 CP completely ensures the execution of profession standard and higher education standard, achieving the aim of good study quality.

The following companies have to be acknowledged for positive experience in cooperation in students' internship and work places provision:

- *Lattelecom Ltd*, Regional Business Development Department, the Head of Riga Division Jānis Noviks;
- *Citrus Solutions Ltd*, Personnel management specialist Zanda Stūra;

On September 28, 2011 *Citrus Solutions Ltd* organised a seminar "Fiber Optics Transmittal Technologies" in which three students participated.

- *Latvijas Energoceltnieks Ltd,* Information and Communications Technologies department director Valērijs Drozds;

In October 2011, third year students Artis Bērziņš, Artis Kancāns un Uģis Vinogradovs started working at Latvijas Energoceltnieks Ltd.

- Fima Ltd, marketing projects manager Zane Vīksne and the Head of Sales Renārs Mazpans.

In October 2011 third year students Arvis Eihvalds un Dainis Siliņš started working at Fima Ltd. The third year students Artūrs Kalniņš un Artis Šehtels started working at *TELE 2*, third year student Roberts Tiļuks started working at *Lattelecom Ltd*; the third year student Madars Jansons started working at *SPX Ltd*, the third year student Ansis Brūvers started working at *Z-light Ltd*, the third year student Agris Lapšuks Arvis started working at *Daina-EL Ltd,* the third year student Konstantīns Jekimovs started working at Optimplus Ltd, the third year student Kārlis Ķikuts started working at *Modulis-Rīga* Ltd.

The employers intend to involve the students of the current study program to various cooperation and qualification improvement projects.

3.3 Studies and Evaluation of Knowledge

To determine students attitude to the study program and the study process organisation, a survey of 2nd and 3rd year students is conducted every year. The results in different academic years vary minimally. The evaluation of different study courses and academic personnel changes a little. The results of the survey are presented in annual self-assessment statements. They show that:

- on the whole, the study program and the study process are positively evaluated;
- The professional preparedness of the academic personnel and their attitude meets students' expectations;
- The relationships in students' environment are positive;
- The students are satisfied with physical facilities, i.e. computer classrooms, laboratories, and their equipment.

Graduates' survey shows that, on the whole, they positively evaluate their studies at College. According to their opinion, in order to improve the study process, the following should be implemented:

- supplement the laboratories with newest telecommunication equipment;
- improve the methodological support of the study process;
- involve the graduates into the process of internship organisation and management;
- involve the graduates into the process of the improvement of study program technical facilities.

3.4 Study Provision and Management

The study program has to be regularly reviewed in compliance with the demands of the labour market in telecommunications. At the end of each academic year the implementation process as well as its correspondence to the labour market requirements are evaluated. As the need arises, the changes in the study course syllabi or the study program are implemented, e.g. the sequence of courses or the number of credit points etc may be altered.

The task of the academic personnel is to help students acquire study program courses. The key tasks of the study program in relation to the academic personnel are the following:

- to retain the existing personnel and improve their qualifications;
- to involve new academic personnel;

This issue may be really solved by

- facilitating favourable psychological environment;
- modernising the work places of the academic personnel, equipping them with computers and OH projectors.
- providing the personnel with latest special literature;
- providing professional development courses;
- inviting guest personnel.

Technical facilities play a significant role in the implementation of the study program, therefore, it is expected to:

- to develop the cooperation with employers to involve them in the material support of the study process;
- to involve students in the process of improvement of technical facilities;
- to supplement the existing laboratories with modern telecommunication equipment;
- to improve the methodological facilities of the study process;
- to update computers and software.

3.5 Academic Personnel and Students Research (Creative) Activities

ICT Infrastructure development has been highlighted in the National Development Plan for the years 2007-2013. The efficient use of ICT opportunities facilitates the state's social economic development and the main Latvian resource is knowledge. Therefore, the government will provide tangible support to education and continuous learning. Higher education forms the basis of society's knowledge, thus, it is significant to ensure qualitative higher education acquisition opportunities to all stakeholders. A specific attention is paid to the increase of the proportion of exact sciences, medical and engineering students. The government also promises its support to renew the prestige of teacher's profession and inform the society about the range of the study programs and professions offered by the higher education institutions.

Students' scientific research (creative work) is closely connected to employers, who employers who are involved in the development of the study program, profession standard and profession classificator actualisation process. The quality of the study program and its further development are closely connected with employers.

Employers are involved in the study process as qualification paper advisors, reviewers and state qualification exam committee members. For instance, *Lattelecom Ltd* Regional Business development department offered a cooperation project with students'cooperation agreements «Optics to the House», involving them in GPON technology implementation in various areas in Riga. As a result, many qualification papers this academic year were designed about optical technologies in telecommunication networks.

In the course of project implementation *Lattelecom Ltd* employees were involved. As a result, students underwent the selection process and were offered a job, who offer new services to clients. The best students were offered a full-time job upon college graduation.

Project implementation is related to the second leading telecommunication company Citrus Solutions Ltd where many students have internship and are further provided with employment. During study excursions students attend employers, getting acquainted with their requirements and latest telecommunication technologies. Employers' contribution to the development of technical facilities of the program is also huge.

3.6 Quality Assurance and Guaranties

Annual SWOT (strength, weaknesses, opportunities and threats) analysis is conducted annually within the framework of the study program *Telecommunications* as well as the internal self-assessment of the academic resources, technical facilities and financial support.

Within the process of the current study program design the experience of *the European Higher Education Area,* Riga Technical University (hereafter RTU) Electronics and Telecommunications Faculty Telecommunications Institute were considered. RTU academic personnel is involved in study program implementation. Riga Technical College also cooperates with RTU College.

In the time period under consideration, a number of RTU students transferred to College and successfully continue their studies.

RTU Electronics and Telecommunications Faculty supports the designed study program and enables telecommunications specialists to continue their studies at RTU to acquire the second level of higher professional education.

The Number of Students (enrolled for the state budget funding and for the tuition fee)

2008/2009 35 students in total; 30 for the state budget funding

2009./2010. 35 students in total; 19 for the state budget funding

2010./2011. 23 students in total; 23 for the state budget funding

The Number of Students (enrolled for the tuition fee)

2008/2009 5 students

2009/2010 16 students

2010/2011 0

Age Distribution of the Elected Academic Personnel

Younger than 25 years -

25 to 44 years 4

45 to 64 years 12

65 years and older 5

Continuity of Studies

2008/2009	-	
2009/2010	1	Graduate Raimonds Andersons;
		Riga Pedagogy and Educational Management Academy
2010/2011	3	Graduate Arturs Buračevskis; Transport Communications Institute
		Graduate Reinis Krops; RTU
		Graduate Eduards Novickis; RTU

4 Cooperation and Overlapping

4.1 Study Program Aims and Tasks

The aim of the study program and the learning outcomes do not differ from other similar study programs in the region. Most courses of the study program have been designed considering employers' recommendations and expectations for preparing specialists for Latvian and European labour market.

4.2 Study Content and Organisation

When developing the study program, RTU study program *Telecommunications* and Lapland Technical College study program *Electronics and Telecommunications* were studied Comparing college program with similar programs in Latvia and abroad, it may be claimed that the program coincides by 75%.

In 2001 College signed a mutual cooperation agreement with Lapland Technical College (Finland) which enables students' and personnel exchange which is organised every year.

Starting with the year 2002, College Information Technologies and Telecommunications department students are enabled to continue the studies at Odense Technical College, Denmark following competition principle.

4.3 Studies and Evaluation of Knowledge

The operational results are compared and analysed in accordance with cooperation agreement of with Lapland Technical College (Finland). The assessment of key performance indicators is completed by Riga Technical College and Lapland Technical College Academic personnel.

4.4 Study Provision and Management

The partnerships with other Latvian and foreign educational institutions provide an invaluable contribution to achieve study results and organise the mobility of the academic personnel and students.

4.5 Academic Personnel and Students Research (Creative) Activities

Currently there is no research (creative work) conducted in cooperation with other Latvian or foreign higher education study program students and academic staff. In the nearest time these activities are supposed to be planned and implemented together with TRU Telecommunications Institute,

4.6 Quality Assurance and Guaranties

Riga Technical College cooperates as an associate member with:

- Latvian Electrical Engineers and Power Construction Engineers Association (LEEA);
- Latvian Information and Communication Technology Association (LIKTA);
- Latvian Authorised Dealers Association (LPAA);
- The Ministry of Education of the Republic of Latvia Quality Service, expert (College Association delegation);
- Higher Education Quality Assessment Centre of the Republic of Latvia (AIKNC), expert;
- Latvian Electrical Equipment and Electronics Industry Association (LEtERA), board member;
- Machine Building and Metalwork Industry Association (MASOC), expert.

Riga Technical College is a member of Latvian Employers' Confederation.