

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**

**NATIONAL TECHNICAL UNIVERSITY  
"KHARKIV POLYTECHNICAL INSTITUTE"**

**APPROVED**

NTU "KhPI" Rector

\_\_\_\_\_ Ye.I. Sokol

« \_\_\_\_ » \_\_\_\_\_ 2019

**EDUCATIONAL-PROFESSIONAL PROGRAM  
"MARKETING"**

**The Second Level of Higher Education**

**Specialty 075 Marketing**

**Branch of Knowledge 07 Management and Administration**

**Qualification: Master of Marketing**

**APPROVED BY  
ACADEMIC COUNCIL OF NTU "KHPI"**

The Head of the Academic Council

\_\_\_\_\_ L.L. Tovazhiansky

Protocol No. \_\_\_\_\_ of

« \_\_\_\_ » \_\_\_\_\_ 2019

**Kharkiv 2019**

**APPROVAL of  
Educational-professional Program**

Second (Master)	Second (Master)
Branch of Knowledge	07 "Management and Administration"
Specialty	075 "Marketing"
Qualification	Master of Marketing

**APPROVED by**  
Scientific-methodical commission on specialty  
"Marketing"  
Head of Commission

\_\_\_\_\_ D.V. Rayko  
« \_\_\_\_ » \_\_\_\_\_ 2019

**RECOMMENDED**  
Methodical Council of NTU "KhPI"  
Deputy Chairman of Methodical Council

\_\_\_\_\_ R.P. Miguschenko  
« \_\_\_\_ » \_\_\_\_\_ 2019

**APPROVED**  
Head of Economics and Marketing Department

\_\_\_\_\_ V.V. Sysoyev  
« \_\_\_\_ » \_\_\_\_\_ 2019

**APPROVED**  
Head of Economic Cybernetics and Marketing  
Management Department

\_\_\_\_\_ V.Ya. Zaruba  
« \_\_\_\_ » \_\_\_\_\_ 2019

**APPROVED**  
Director of Educational and Scientific  
Institute of Economics, Management and  
International Business

\_\_\_\_\_ O.V. Manoylenko  
« \_\_\_\_ » \_\_\_\_\_ 2019

**APPROVED**

Order of the Rector of the National Technical University "Kharkiv Polytechnic Institute" of "  
\_\_\_\_\_ " \_\_\_\_\_ 20\_\_\_\_, № \_\_\_\_\_.

*This educational-professional program can not be fully or partly reproduced, published and distributed without the permission of the National Technical University "Kharkiv Polytechnic Institute".*

## **PREFACE**

Developed on the basis of the Draft Standard of Higher Education, Specialty 075 “Marketing” for the second (master) level by the project team of Specialty 075 “Marketing” in the National Technical University “Kharkiv Polytechnic Institute”, consisting of:

**Head of the project team** (program guarantor) - Rayko Diana Valeriyivna, Doctor of Economics, Professor, Professor of Economic Cybernetics and Marketing Management Department

### **Project team members:**

1. Kosenko Olexandra Petrivna - Doctor of Economics, Professor, Professor of Economics and Marketing Department.
2. Shypulina Yuliia Sergiyvna - Doctor of Economics, Associate Professor, Professor of Economic Cybernetics and Marketing Management Department
3. Tkatchova Nadiya Petrivna - Candidate of Economic Sciences, Associate Professor, Associate Professor of Economics and Marketing Department.
4. Kitchenko Olena Mykolayivna - Candidate of Economic Sciences, Associate Professor, Associate Professor of Economics and Marketing Department.
5. Kobelev Valery Mykolayovych - Candidate of Economic Sciences, Associate Professor, Associate Professor of Economics and Marketing Department.
6. Romanchyk Tetiana Volodymyrivna - Candidate of Economic Sciences, Associate Professor, Associate Professor of Economics and Marketing Department.
7. Miroshnyk Mariya Volodymyrivna - Candidate of Economic Sciences, Associate Professor, Associate Professor of Economics and Marketing Department.

### **Рецензії-відгуки зовнішніх стейкхолдерів:**

1. Мельник В., директор з маркетингу ТОВ «Сталекс Профі».
2. Цой В., директор ТОВ «Сілланіум».
3. Чумак Я., засновник Маркетингового агентства повного циклу «Defense».
4. Усова Т., фахівець з підбору персоналу, Компанія Intetics.
5. Чичкань Є., провідний фахівець з розвитку персоналу ПАТ «САН ІнБев Україна».

# 1. PROFILE OF EDUCATIONAL-PROFESSIONAL PROGRAM FOR SPECIALTY 075 "MARKETING"

<b>1 – General Information</b>	
<b>Full name of institution of higher education and the structural subdivision</b>	National Technical University "Kharkiv Polytechnic Institute" Economics and Marketing Department, Economic Cybernetics and Marketing Management Department
<b>Level of higher education and original qualification title</b>	Master, Master of Marketing
<b>The official title of the educational program</b>	Educational-professional specialized program "Marketing"
<b>Type of diploma and volume of educational program</b>	Master degree, single, 90 ECTS credits, 1 year 4 months
<b>Accreditation</b>	Order of the Ministry of Education and Science of Ukraine #1565, 19.12.2016
<b>Cycle / level of the program</b>	FQ-EHEA – 2 <sup>nd</sup> cycle, QF LLL – 7 level, NQF – 8 level
<b>Prerequisites</b>	Bachelor, Specialist, Master
<b>Language (s) of teaching</b>	Ukrainian, English
<b>Educational program validity</b>	According to the accreditation certificate
<b>Internet address of educational program placement</b>	<a href="http://web.kpi.kharkov.ua/uk/">http://web.kpi.kharkov.ua/uk/</a>
<b>2 - The Aim of the Educational Program</b>	
<p>The aim of the educational program is to train specialists in the field of marketing activities of the enterprise (subdivision) with the basic knowledge and practical skills in planning, organization, implementation and control of marketing activities at the enterprise in terms of development and implementation of commodity, pricing, sales, communication policy taking into account information support on the basis of scientific and systemic approaches, providing relevant competencies.</p> <p>At the Bachelor level, marketing is seen primarily as a set of tools, means, through which the company examines the situation on the market and affects it. But the current practice of enterprises shows that marketing tools (commodity, price, promotion, distribution) need their integration into the overall enterprise management system, that is, the use of enterprise management on the principles of marketing, i.e. the integration of marketing and management.</p> <p>The program is balanced in terms of social and humanitarian and fundamental training, which gives the opportunity to get basic knowledge of general, professional training in the subjects of free choice courses: "Advertising Business", "Marketing and Legal Protection of Intellectual Property", "International Marketing", "Marketing Management".</p>	
<b>3 – Characteristics of the Educational Program</b>	
<b>Subject area (branch of knowledge, specialty, specialization)</b>	Branch of Knowledge: Management and Administration Specialty: Marketing
<b>Orientation of the educational program</b>	Educational-professional program with applied orientation. Professional accents: forming of the ability to carry out marketing, administrative, analytical, project and research activities using modern innovative approaches, technologies and methods of managing marketing activities at enterprises and organizations.
<b>The main focus of the educational program and specialization</b>	General education in specialty 075 "Marketing".

	Key words: marketing, advertising, marketing complex, marketing commodity policy, distribution activities, merchandising, marketing solution, marketing strategy, Internet marketing.
<b>Peculiarities of the program</b>	The program is multiprofile and proposes training to form skills necessary to manage marketing activities at modern enterprises.
<b>4 – Suitability of Graduates for Employment and Further Education</b>	
<b>Suitability for employment</b>	Professional opportunities for graduates (according to the Classifier of Professions SC 003: 2010). 1233 Heads of marketing departments; 1234 Heads of advertising and PR departments; 1237.1 The main specialists - heads of scientific and research subdivisions, scientific and technical preparation of production subdivisions and other heads; 1475 Managers (directors) in law, accounting, market research, public opinion studies, business and management consultancy; 1475.4 Managers (directors) in business and administration; 1476.1 Managers (directors) in advertising; 241 Professionals in the field of civil service, auditing, accounting, labor and employment, marketing, business efficiency, production streamlining and intellectual property; 2419 Professionals in the field of civil service, marketing, efficiency of economic activity, production streamlining, intellectual property and innovation activity; 2419.1 Scientific staff (marketing, efficiency of economic activity, production streamlining, intellectual property); 2419.2 Professionals in the field of marketing, efficiency of economic activity, production streamlining, intellectual property and innovation activities..
<b>Further education</b>	It is possible to continue postgraduate education to obtain professional qualifications in accordance with the relevant professional standards.
<b>5 – Teaching and Assessment</b>	
<b>Teaching and Learning</b>	Student-centered education, which is conducted in the form of lectures, seminars, practices, consultations, independent study, coursework based on working with textbooks, manuals, periodical scientific publications, use of the Internet
<b>Assessment</b>	Current and final control of knowledge (surveys, control and individual tasks, testing, etc.), Credits and examinations (oral and written), presentations, qualification work, practice report, public presentation of qualification work.

<b>6 – Program Competencies</b>	
<b>Integrated Competence</b>	Ability to solve complex special tasks and practical problems in marketing activities or in the process of learning, which involves the application of relevant theories and methods and is characterized by complexity and uncertainty of conditions.
<b>General Competencies</b>	<p>GC1. Ability to detect, identify and solve problems, ability to make appropriate decisions.</p> <p>GC2. Ability to adapt and act in uncertain situations, generate new ideas (creativity) and knowledge.</p> <p>GC3 Ability to manage, show initiative and entrepreneurship, ensure the quality of the work done.</p> <p>GC4. Knowledge and understanding of the subject area of marketing activities.</p> <p>GC5 Ability to communicate with representatives of different professional groups of different levels, to negotiate.</p> <p>GC6. Ability to think critically, analyze, synthesize, search and process information</p>
<b>Professional competencies of the specialty (defined by the standard of higher education specialty)</b>	<p>SC1 Be aware of the latest theories, interpretations, methods and practices of marketing.</p> <p>SC2 Ability to interpret critically the results of the latest theoretical and practical research in the field of marketing.</p> <p>SC3 Ability to conduct independent research and interpret its results in the subject area of marketing.</p> <p>SC4 Ability to demonstrate a creative approach to work on a specialty.</p> <p>SC5 Ability to diagnose various aspects of marketing activities of a market entity, marketing analysis and forecasting.</p> <p>SC6 Ability to identify a set of effective means for managing marketing activities.</p> <p>SC7 Ability to develop a marketing strategy of a market entity and ways of its implementation, taking into account interfunctional relationships.</p> <p>SC8 Ability to manage the marketing activities of a market entity at the organization, subordinate, group, network level.</p> <p>SC9 Ability to manage projects and realize their results in the field of marketing activities.</p>
<b>Professional competencies of the course of subjects 01 “Advertising Business” (defined by the higher education institution)</b>	<p>SC1.10. Ability to analyze, develop, plan, and implement the practical implementation and control of the effectiveness of a set of promotional activities aimed at achieving specific marketing goals.</p> <p>SC1.11 Ability to develop a system of measures for providing a positive image of the company, organization, institution.</p> <p>SC1.12 Ability to substantiate directions of development of brands of the enterprise, taking into</p>

	account the features of its internal and external environment.
<b>Professional competencies of the course of subjects 02 “Marketing Research” (defined by the higher education institution)</b>	<p>SC2.10 Ability to develop new market research techniques and use them in market research at the local, regional, global levels, B2B and B2C markets, industry markets.</p> <p>SC2.11 Ability to form the main effective components of the marketing activity of the enterprise, organization, institution: the ability to identify marketing problems and the direction of marketing research, marketing product, marketing, communication policy and pricing, control.</p> <p>SC 2.12 Ability to demonstrate knowledge and understanding of the processes of studying the domestic and foreign market of goods and services; to define commodity markets, their structure, features and trends of development; to choose markets, to study the factors shaping the needs of consumers and their behavior in certain segments of the market.</p>
<b>Professional competencies of the course of subjects 04 “Marketing Management” (defined by the higher education institution)</b>	<p>SC4.10 Form a mechanism for managing socially responsible marketing.</p> <p>SC4.11 Ability to develop brand models and evaluate their potential, typical schemes for brands promotion in the channels of commodity circulation.</p> <p>SC4.12 Ability to analyze, develop, plan, implement and control the efficiency of a set of promotional activities aimed at achieving specific marketing objectives.</p>
<b>7 – Acquired Program Results</b>	
<b>Acquired program results in specialty (defined by the standard of higher education specialty)</b>	<p>R1. Demonstrate the appropriate level of knowledge of the latest theories, methods and practical methods of marketing.</p> <p>R2 Understand the content of scientific and professional literature, new achievements in marketing theory and practice, contribute to their development.</p> <p>R3 Have the skills that are sufficient to carry out their own research and decision making in the field of marketing.</p> <p>R4 Demonstrate the ability to develop strategy and tactics of marketing activity, including in the international environment.</p> <p>R5 Make presentations, publicize results of scientific and applied research, marketing projects.</p> <p>R6 Demonstrate knowledge of scientific principles and understanding of practical aspects for further improvement of marketing activities.</p> <p>R7 Substantiate the changes and improvements in the marketing system, the realization of which is necessary for obtaining positive results of the market entity work.</p> <p>R8 Use methods of interpersonal communication in solving collective problems, conducting negotiations, scientific discussions in the field of marketing.</p>

	<p>R9. Demonstrate understanding of the essence and peculiarities of the use of marketing tools in the process of marketing decisions making.</p> <p>R10 Solve complex marketing problems and solve problems under uncertainty with the use of modern managerial approaches, methods, techniques.</p> <p>R11. Use methods of marketing strategic analysis and interpret its results in order to improve the marketing activities of a market entity.</p> <p>R12 Conduct diagnostics and strategic and operational management of marketing in order to develop and implement marketing strategies, projects and programs.</p> <p>R13 Manage the marketing activity of a market entity, as well as its divisions, groups and networks; determine the criteria and indicators for its evaluation.</p> <p>R14. Form a marketing system of interaction, to build long-term mutually beneficial relations with other market entities.</p>
<b>Acquired program results in the course of subjects 01 “Advertising Business” (defined by the higher education institution)</b>	<p>R1.15. Ability to manage the implementation of a range of promotional activities effectively.</p> <p>R1.16 Develop the system of measures for creating a positive image of the organization (enterprise).</p> <p>R1.17 Design brand development directions based on evaluation of the marketing environment factors of the organization (enterprise).</p>
<b>Acquired program results in the course of subjects 02 “ Marketing Research” (defined by the higher education institution)</b>	<p>R2.15 Ability to generate new market research techniques.</p> <p>R.2.16 Ability to identify and solve marketing problems based on marketing research.</p> <p>R2.17 Ability to demonstrate the results obtained in the course of marketing research.</p>
<b>Acquired program results in the course of subjects 04 “Marketing Management” (defined by the higher education institution)</b>	<p>R4.15 Apply marketing tools for the formation of a socially responsible marketing policy of the enterprise.</p> <p>R4.16 Ability to use modern information technologies for the development of the company. Development of measures for its reduction in the market.</p> <p>R4.17 Ability to evaluate the effectiveness of a range of advertising activities and plan further directions of development of the organization (enterprise).</p>
<b>8 – Resource Support for the Implementation of the Program</b>	
<b>Staffing</b>	Corresponds to the staffing requirements for the the implementation of educational activities in the field of higher education in accordance with the current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine "On approval of licensing conditions for the educational activities of educational institutions" dated December 30, 2015, No. 1187, as amended by the CM Resolution No. 347 dated May 10, 2018)
<b>Facilities support</b>	Corresponds to the facilities support requirements for the the implementation of educational activities in the field of higher education in accordance with the current

	legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine "On approval of licensing conditions for the educational activities of educational institutions" dated December 30, 2015, No. 1187, as amended by the CM Resolution No. 347 dated May 10, 2018)
<b>Information and educational support</b>	Corresponds to the information and educational support requirements for the the implementation of educational activities in the field of higher education in accordance with the current legislation of Ukraine (Resolution of the Cabinet of Ministers of Ukraine "On approval of licensing conditions for the educational activities of educational institutions" dated December 30, 2015, No. 1187, as amended by the CM Resolution No. 347 dated May 10, 2018)
<b>9 – Academic Mobility</b>	
<b>National credit mobility</b>	On terms of bilateral agreements between the National Technical University "Kharkiv Polytechnic Institute" and higher educational institutions of Ukraine
<b>International credit mobility</b>	Academic mobility on terms of bilateral agreements between the National Technical University "Kharkiv Polytechnic Institute" and the University of Miskolc (Hungary), Maribor University (Slovenia); Otto von Gerrike University of Magdeburg (Germany); Szczecin University, (Poland)
<b>Training of foreign applicants</b>	It is possible after mastering the course of the Ukrainian language

## 2. LIST OF COMPONENTS OF THE EDUCATIONAL PROGRAM

Code	Components of the educational program (subjects, projects / work, practice, qualification work)	Number of ECTS credits	Form of final assessment
<b>COMPULSORY COMPONENTS OF THE EDUCATIONAL PROGRAM</b>			
<b>1. General Training</b>			
GT 1	Global Economics	3.0	Credit
GT 2	Occupation and Professional Activities Safety	3.0	Credit
GT 3	Intellectual Property	3.0	Credit
<b>2. Professional Training</b>			
PT 1	E-commerce	4.0	Exam
PT 2	Relations Marketing	4.0	Exam
PT 3	Project Management	4.0	Exam
PT 4	Quantitative Methods in Marketing Management	4.0	Exam
PT 5	Innovative Development of the Enterprise	4.0	Exam
PT 6	Marketing Management	4.0	Exam
<b>3. Subjects of Free Choice Courses</b>			
<b>3.1.1 Course of Subjects 01 «Advertising Business»</b>			
FC1.1	Strategic Marketing and Product Innovation Policy	6.0	Exam
FC1.2	Advertising Management	5.0	Exam
FC1.3	Advertising Technology	5.0	Credit
FC1.4	Evaluating the Effectiveness of Advertising	4.0	Exam
FC1.5	Brand Management	4.0	Exam
FC1.6	Fundamentals of Scientific Research	3.0	Credit
	Practice	15.0	Credit
	Assessment	15.0	Credit
<b>3.1.2 Course of Subjects 02 «Marketing Research»</b>			
FC2.1	Market Research and Forecasting of Market Conditions	6.0	Exam
FC2.2	Research, Analysis and Evaluation of Business Efficiency	5.0	Exam
FC2.3	Marketing Risks	4.0	Exam
FC2.4	Interactive Marketing	5.0	Credit
FC2.5	Marketing Research Management	4.0	Exam
FC2.6	Fundamentals of Scientific Research	3.0	Credit
	Practice	15.0	Credit
	Assessment	15.0	Credit
<b>3.1.4 Course of Subjects 04 «Marketing Management»</b>			
FC4.1	Strategic Management	6.0	Exam
FC4.2	External Economic Marketing Activities	4.0	Credit
FC4.3	Planning Advertising Campaigns	5.0	Exam
FC4.4	Branding	5.0	Exam
FC4.5	Socially Responsible Marketing	4.0	Exam
FC4.6	Fundamentals of Scientific Research	3.0	Credit
	Practice	15.0	Credit
	Assessment	15.0	Credit
	Total Amount for Training Period	90.0	

### 3. STRUCTURAL AND LOGICAL SCHEME OF THE EDUCATIONAL PROGRAM

	General Training	Professional Training	Subjects of Free Choice Courses	Assessment
1 semester	<p>GT1 Global Economics (3 credits)</p>	<p>PT1 E-commerce (4 credits)</p> <p>PT2 Relations Marketing (4 credits)</p> <p>PT3 Project Management (4 credits)</p>	<p>Course of Subjects 01 «Advertising Business»</p> <p>FC1.1 Strategic Marketing and Product Innovation Policy (6 credits)</p> <p>FC1.3 Advertising Technology (5 credits)</p> <p>FC1.5 Brand Management (4 credits)</p>	<p>Course of Subjects 04 «Marketing Management»</p> <p>FC4.1 Strategic Management (6 credits)</p> <p>FC4.2 External Economic Marketing Activities (4 credits)</p> <p>FC4.4 Branding (5 credits)</p>
2 semester	<p>GT2 Occupation and Professional Activities Safety (3 credits)</p> <p>GT3 Intellectual Property (3 credits)</p>	<p>PT4 Quantitative Methods in Marketing Management (4 credits)</p> <p>PT5 Innovative Development of the Enterprise (4 credits)</p> <p>PT6 Marketing Management (4 credits)</p>	<p>Course of Subjects 02 «Marketing Research»</p> <p>FC2.1 Market Research and Forecasting of Market Conditions (6 credits)</p> <p>FC2.4 Interactive Marketing (5 credits)</p> <p>FC2.5 Marketing Research Management (4 credits)</p>	<p>FC4.3 Planning Advertising Campaigns (5 credits)</p> <p>FC4.5 Socially Responsible Marketing (4 credits)</p> <p>FC4.6 Fundamentals of Scientific Research (3 credits)</p>
3 semester				<p>Practice (15 credits)</p> <p>Assessment (15 credits)</p>

**4. DISTRIBUTION OF THE EDUCATIONAL PROGRAM CONTENT  
BY GROUPS OF COMPONENTS AND TRAINING CYCLES**

№	Training Cycle	Amount of Training for a Higher Education Applicant (credits /%)		
		Compulsory components of the educational-professional program	Elective components of the educational-professional program	Total for Training Period
1	2	3	4	5
1	Cycle of General Training	<b>9 / 30</b>	<b>- / -</b>	<b>9 / 10</b>
2	Cycle of Professional and Practical Training	<b>24 / 27</b>	<b>57 / 63</b>	<b>81 / 90</b>
Total for Training Period		<b>33 / 37</b>	<b>57 / 63</b>	<b>90 / 100</b>

**5. ASSESSMENT OF THE HIGHER EDUCATION APPLICANTS**

The assessment is carried out in the form of public defense of the qualification work results in issuing document of the established sample getting the Master degree with the qualification: "**Master of Marketing**". The assessment can be carried out in presence of representatives of employers and their associates. The assessment is carried out openly and publicly. The qualification work must be checked on plagiarism.

**6. MATRIX OF CONFORMITY OF PROGRAM COMPETENCIES TO THE COMPONENTS OF THE EDUCATIONAL PROGRAM**

	GT1	GT2	GT3	PT1	PT2	PT3	PT4	PT5	PT6	FC1.1	FC1.2	FC1.3	FC1.4	FC1.5	FC1.6	FC2.1	FC2.2	FC2.3	FC2.4	FC2.5	FC2.6	FC4.1	FC4.2	FC4.3	FC4.4	FC4.5	FC4.6
GC1	+	+			+				+	+	+			+		+	+	+	+					+			+
GC2	+		+	+		+		+		+	+	+	+				+		+	+			+				
GC3		+				+		+	+			+	+	+					+	+			+		+		
GC4				+			+		+		+			+	+	+	+	+	+	+	+						
GC5		+			+				+						+					+	+		+		+	+	
GC6			+	+		+	+			+	+	+		+	+	+	+	+	+	+	+	+	+	+	+		
SC1							+	+		+	+	+			+	+		+	+	+	+	+					+
SC2				+		+	+			+				+	+		+	+	+	+	+	+			+		+
SC3				+		+									+				+	+	+	+	+				+
SC4				+	+	+			+		+	+	+							+					+		
SC5	+							+		+			+	+	+	+	+	+	+	+	+			+			
SC6						+		+	+			+					+			+			+				
SC7	+				+			+		+				+						+			+			+	
SC8					+				+					+					+				+			+	
SC9				+		+	+	+															+	+			
SC1.10													+														
SC1.11											+	+		+													
SC1.12														+													
SC2.10																+		+	+								
SC2.11																		+	+								
SC2.12																+		+									
SC4.10																										+	
SC4.11																									+		
SC4.12																							+	+	+		

**7. MATRIX OF PROVIDING EDUCATION RESULTS TO RELATED COMPONENTS OF EDUCATIONAL PROGRAM**

	GT1	GT2	GT3	PT1	PT2	PT3	PT4	PT5	PT6	FC1.1	FC1.2	FC1.3	FC1.4	FC1.5	FC1.6	FC2.1	FC2.2	FC2.3	FC2.4	FC2.5	FC2.6	FC4.1	FC4.2	FC4.3	FC4.4	FC4.5	FC4.6	
R1				+		+	+	+	+	+	+	+		+	+	+	+	+	+	+	+			+		+	+	
R2				+		+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+			+		+	+
R3	+	+		+	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+	+	+		+		+	+
R4	+				+	+		+	+	+		+		+			+		+	+	+		+	+			+	
R5				+		+	+	+															+	+				
R6				+		+	+	+		+	+	+		+	+	+	+	+	+	+	+	+			+		+	+
R7	+	+	+	+	+	+		+	+	+	+	+	+	+			+		+	+	+		+	+		+		
R8		+			+				+						+						+	+		+		+	+	
R9				+	+	+		+	+		+	+	+				+				+			+		+		
R10	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+			+
R11	+				+			+		+			+	+	+	+	+	+	+	+		+	+		+		+	
R12	+				+			+		+			+	+	+	+	+	+	+	+		+	+		+		+	
R13		+			+	+		+	+			+	+	+					+				+			+	+	
R14		+			+				+					+	+				+	+	+	+	+	+		+	+	
R1.15													+															
R1.16											+	+		+														
R1.17													+															
R2.15																+		+	+									
R2.16																		+	+									
R2.17																+		+										
R4.15																											+	
R4.16																										+		
R4.17																							+	+	+			