

## COURSE SHEET

Course name	<b>QoS Packet Networks Design</b>
Acronym	QPND

Level:

1. (BSc)	2. (MSc)
	X

Field of study:

Electronics and Telecommunications	Control Engineering and Robotics	Informatics
X		

Person responsible for the course:

Name:	Sylwester
Surname:	Kaczmarek
E-mail:	Sylwester.Kaczmarek@eti.pg.gda.pl

## List of Topics - Lecture

No	Topic	Level of					No of hours
		knowledge			skills		
		A	B	C	D	E	
1.	Aims and tasks of design the NGN and NGI networks.		X				1
2.	Parameters describing QoS and GoS packet networks for IP QoS, MPLS, ATM and DWDM technologies.		X				1
3.	Elements of teletraffic engineering are needed for design.		X				1
4.	Models of traffic source and streams.			X			1
5.	Self-similarity and its measure; short- and long-range dependent streams.			X			1
6.	Guaranteed different class of service (streaming, elastic).			X			1
7.	Service system models for edge (access).			X			1
8.	Service system models in domens (core).			X			1
9.	Effective bandwidth and calculation methods.						1
10.	Statistical multiplexing – REM and RS model.						1
11.	e2e delay budget and its variation in design.			X			1
12.	Application of large deviation theory.			X			1
13.	Traffic control mechanisms and its design.			X			1
14.	CAC, DBAC and MBAC function.		X				1
15.	Traffic flow in network and describing source – destination path.			X			1
16.	Z model in network design.		X				1
17.	Formal description of design.		X				1
18.	Edge conditions for design tasks solving of resources (bandwide, paths, number of wave length) taking into account the cost.			X			1
19.	Allocation traffic design.			X			1
20.	Optimisation of path selection.			X			1
21.	Cost minimize problem for set of traffic class and QoS, structure, control and technology.			X			1
22.	Linear programming methods for solving task design.			X			1
23.	Integer programming method for solving task design.			X			1
24.	Evolution algorithms for solving task design.		X				1
25.	One layer design for IP QoS, MPLS and DWDM technology.			X			1
26.	Multi layer design for IP QoS, MPLS and DWDM technology.			X			1
27.	Traffic grooming.			X			1
28.	Designing of networks resistive on damages.			X			1
29.	Designing of networks resistive on variation of traffic matrix.						1
30.	Point design between PSTN/ISDN/GSM and IP QoS networks.			X			1
<b>Total</b>							<b>30</b>

**List of Topics - Project**

<i>No</i>	<i>Topic</i>	<i>Level of</i>					<i>No of hours</i>
		<i>knowledge</i>			<i>skills</i>		
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
1.	Describing the individual project themes.				X		1
2.	Calculation of traffic parameters for core packet networks.					X	1
3.	Calculation of traffic parameters for edge of packet networks.					X	1
4.	Describing the value parameters for traffic control and shaping mechanisms.					X	1
5.	Traffic flow design in core network for two class of services (streaming, elastic).					X	1
6.	Path bandwidth capacity design for two class of services (streaming, elastic).					X	1
7.	Medium resource design between PSTN/ISDN/GSM and IP QoS networks.					X	1
8.	Formulation of edge conditions for design IP QoS layer with class traffic.				X		0,67
9.	Formulation of edge conditions for design MPLS layer with class traffic.				X		0,67
10.	Formulation of edge conditions for design DWDM layer with class traffic.				X		0,67
11.	Solving optimisation for IP QoS layer.					X	0,67
12.	Solving optimisation for MPLS layer.					X	0,67
13.	Solving optimisation for DWDM layer.					X	0,67
14.	Formulation of edge conditions for design of networks resistive on damages and variation of traffic matrix.				X		1
15.	Solving optimisation of networks resistive on damages and variation of traffic matrix.					X	1
16.	Formulation of edge conditions for design multi layer network IP QoS/MPLS/DWDM with class traffic.				X		1
17.	Reception of carried out projects.				X		1
						<b>Total</b>	<b><u>15</u></b>