



**Saint Petersburg State
Technological University
of Plant Polymers:**

**incorporation of chemometrics
into its research and educational
activities**

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Saint Petersburg State Technological University of Plant Polymers (SPb STUPP)

Specialized field - integrated training of specialists for industrial enterprises engaged in in-depth chemical processing of wood (the pulp and paper industry)

There are 6 traditional faculties and a new one:

- Chemical Engineering;
 - Environmental Engineering;
 - Mechanical Engineering;
 - Automated Process Control Systems;
 - Industrial Power Engineering;
 - Economics & Management;
 - Humanities - a new one
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- *16 programmes of specialists (engineers) training;*
 - *7 directions for Bachelors training*
 - *5 directions for Masters training*
 - *Postgraduate and Doctor's Degree courses*

Joint Master's Degree Programmes

**SPb STUPP and Lappeenranta University of Technology
(LUT), Finland :**

Double Diploma Scheme – Training under Master's Degree Programmes of the two universities with issuing Finnish and Russian Diplomas of Masters of Science in Technology

Master's Degree Programmes	SPb STUPP Faculties – participants of the programmes:
1. Bioenergy Technology	Industrial Power Engineering and Environmental Engineering
2. Chemical and Process Engineering	Chemical Engineering
3. Mechanical Engineering	Mechanical Engineering
4. Electrical Engineering	Automated Process Control Systems



For 3 years, 20 STUPP students have completed training at LUT under joint Master's Degree Programmes

2009/2010 academic year:

12 STUPP students take part in the joint programmes:

Bioenergy Technology - 3 students of the Faculty of Industrial Power Engineering and 2 students of the Faculty of Environmental Engineering

Chemical and Process Engineering – 5 students of the Faculty of Chemical Engineering;

Mechanical Engineering – 2 students of the Faculty of Mechanical Engineering

Benefits from training under joint programmes:

- Study of a number of subjects unincorporated into SPb STUPP curricula;
- Orientation of educational process to development of abilities to put the gained knowledge into practice, to analyze manufacturing and market situations;
- The wide use of computer technologies in the training process;
- Improved English language skill;
- Acquiring habits of contacts in the international society;





SPb STUPP Research relevant to the use of chemometrics

Lines in research:

Faculty of Automated Process Control Systems:

Pulp and paper production –

an industrial sector where on-line process control together with fault detecting are strongly required:

- The use of statistical methods in process monitoring and diagnostics → numerous studies of Dr L.A. Rusinov (Professor of this Faculty) and his colleagues;

Department of Physics

- ✓ **Analysis of effects different pulp production and paper making processes produce on properties of wood components, pulps and papers -
Chemometrics methods as a mathematical tool for interpreting FTIR-spectra of different wood species, pulps and papers**
 - **Studies under supervision of Dr O.Yu. Derkacheva:**
 - **FTIR-spectroscopy and chemometrics approach for analysis of kraft pulps;**
 - **FTIR-spectroscopy and PCR for studying effects of bleaching and ageing on paper brightness – *Poster P43***

Department of Physics

- ✓ **The use of chemometrics approach for decomposing vibrational spectra of majority of oxide glass forming systems with the aim to investigate intermediate-range order in glasses**

→ **Studies under supervision of Prof. O.V. Yanush**

Application of factor analysis confirmed the results obtained on the basis of constant stoichiometry groupings concept

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Chemometrics Teaching

the aim - to include chemometrics as a discipline into curricula of a number of the university faculties

The first steps in this direction:

2008/2009 – The project granted by the Nordic Council of Ministers

«Distance Learning Course in Chemometrics for Technological and Natural Science Mastership Education»

oriented to development of the chemometrics course introducible into Master's Degree Programmes of Technical Universities.

Project participants:

ICP RAS, SPb STUPP, Russia; LUT, Finland; AAUE, Denmark

- The international conference on methodological aspects of chemometrics teaching (SPb STUPP),**
- the international workshop devoted to new scientific developments with chemometrics approach (LUT),**
- practical studies for students of Saint Petersburg and Finnish universities have been held in the frames of the project.**

