

IUVSTA Technical Training Courses

Introduction

A IUVSTA Program of New Educational Activities was successfully launched in the 2001-2004 triennium. Four requests from national vacuum societies were approved and individual grants of about 3,500 CHF were made. At the IUVSTA General Meeting 15 held in Venice in 2004, it was decided that for the 2004-2007 triennium a budget of 15,000 CHF would be available for this kind of Educational Activities. This would be used to support nationally developed/organized IUVSTA Technical Training Courses (ITTC) delivered in local languages at the rate of about four per Triennium. The goal to establish technical training courses in member Societies of the IUVSTA. The IUVSTA grants are primarily intended to be used for travelling/accommodation subsidies within their own national borders for participants and lecturers at the Technical Short Courses.

In general, IUVSTA will not financially support a series of ITTC's taking place in the same country in consecutive years. A second ITTC organized by a National Vacuum Society may be financially supported by IUVSTA if the second ITTC has a completely different topic. However, National Vacuum Societies applying for the first time have priority for support if otherwise all requirements for organizing a successful ITTC are satisfied.

Applications

The Application should answer the following questions:

location/date of courses; stand-alone course offering or part of a conference/workshop

title and content (abstract or outline) of each course

intent of the courses

who are the teachers; what language

expected educational and job level of students

expected average number of students per course

finances: cost per course in Euros, CHF, or US\$; sources and total amount of support; amount asked of us and how will it be used.

A sample application (submitted by the Polish Vacuum Society) which resulted in a very successful Technical Training Course, is reproduced below.

Report

The Society - recipient of the grant, is required (within 1 month after ITTC completion) to file the Report to the IUVSTA Education Committee which should inform on:

Title, location, and date of the TSC

Intent of the course, language of the course

List of teachers and attendants (with affiliations)

Names of beneficiaries of the IUVSTA support, with spending specifications

Coordinator

The Coordinator for the Technical Training Courses for Triennium 2004-2007 is

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**Application of the Polish Vacuum Society
for the IUVSTA Technical Short Course Grant in 2005**

1. Course location: Jagiellonian University, Kraków, Poland; stand-alone course.
2. Tentative time: 27-29 October, 2005
3. Title and content of each course:

Part I: Basic physical processes relevant for vacuum technology (3+2 h):

Introduction:

- a concept of vacuum (definition, units, history)
- applications of the vacuum technology

Kinetic theory of gases, ideal gas, molecular incidence rate and cosine law, transport phenomena, thermal transportation, gas flow.

Physical and chemical phenomena at gas/solid interface:

- physisorption, chemisorption
- desorption rate
- cryotrapping
- diffusion of gases through solid (metal)
- interaction of particles with solid surface.

Part II: Methods and devices for obtaining vacuum (2 h):

Basics of pumping technology, mechanical vacuum pumps (rotary pump, dry pump), turbomolecular pump, diffusion pump, cryopump, getter pump, ion pump.

Part III: Vacuum measurements (4 h):

Vacuum measurement and gauges: manometers, thermocouple manometer, ionization gauges (hot, cold cathode), calibration of vacuum gauge.

Partial pressure measurements: mass spectrometry/spectroscopy, ion sources - ionisers, ion detectors, mass analysers (magnetic deflection, quadrupole mass filter, time-of-flight), data analysis.

Leak detection: leak rate, leak detection techniques, mass spectrometer leak detection.

Part IV: Applications of vacuum in industry (3 h):

Practical examples of vacuum applications in various industrial processes selected and reviewed by representatives of the Polish vacuum companies.

4. Goals of the course:

The Technical Short Course is offered mainly to Polish technicians, production engineers, junior researchers and students responsible for safe handling/operation and maintenance of vacuum equipment/systems in the local industries and laboratories of educational and research institutions. The Course should significantly enhance the knowledge and understanding of basic physical processes relevant for vacuum technology, provide practical knowledge required for every day operation of vacuum devices and measurements of vacuum, as well as introduce the trainees to selected aspects of technological processes requiring vacuum. Personal interaction between the course instructors and the trainees shall help in establishing long term contacts for future consulting and distribution of knowledge between academic circles, vacuum equipment producers and distributors, and vacuum practical users. The Course will end with test evaluation of the participant progress.

The participants passing the required evaluation limit will be entitled for receiving the course certificate issued by the Polish Vacuum Society.

5. Teachers (all lectures will be in Polish):
 - Prof. Andrzej Hałas – Wrocław University of Technology, Wrocław
 - Prof. Stanisław Hałas – Maria Curie-Skłodowska University, Lublin
 - Dr. Piotr Szwemin – Warsaw University of Technology, Warszawa
 - Dr. Janusz Budzioch – Prevac - Vacuum Company
 - Maria Tymieniecka – COMEF – Vacuum Company
 - Ryszard Tyrankiewicz – ŻART – Vacuum Company
6. Expected educational and job level of students:
 - a) educational level: at least with senior high school education
 - b) job level: technician
7. Expected average number of students per course: min. 30
8. Finances:

Cost of Short Technical Course in CHF:

 - a) Total cost of STC: **7 200 CHF**,
 - b) Expected total amount of IUVSTA support: **3500 CHF** (IUVSTA grant),
 - c) STC participant regular fee without IUVSTA support (including full board accommodation per one participant): 250 CHF,
 - d) Full board accommodation cost (per participant): 190 CHF,
 - e) Travel costs for one participant (estimated value): 35 CHF,
 - f) Proposed IUVSTA financial support towards participant accommodation and travel : **140 CHF** per person.
 - g) Expected number of IUVSTA supported participants: 25 persons.

On behalf of the Polish Vacuum Society:

/-/ Prof. Marek Szymonski,
President, PVS Executive Board