

Technical Training Course on Science and Technology of Vacuum in Spanish Language.

The proposed course is comprised of 20 lectures of 1h30 to complete 30h, coordinated by Arantzazu Mascaraque (Universidad Complutense de Madrid) and Juan de la Figuera (Spanish Science Council, CSIC). The course, in this on-line format, has been run already in a first edition in October-November 2021 with 91 registered students. 75 obtained the diploma after complying with 80% attendance and success in two tests. For the preparation of the tests, the students had access to a virtual campus. The course was given by the detailed lecturers (see outline), which could slightly change for next edition. The lecturers were chosen looking for a certain gender, geographical and sector balance. In view of the success of the course in Latin American countries (received already students from Chile and Colombia), we will consider substituting lecturers from other IUVSTA associated countries (Argentina, Mexico). We are looking for shared economical efforts for the next edition, foreseen for the springtime (March-May) 2023.

- LOCATION: On-Line with lecturers at their local institutions
- DATE OF COURSE: Springtime 2023. 20 online sessions.
- STAND-ALONE COURSE OR PART OF A CONFERENCE or WORKSHOP:
Stand alone course.
- OBJECT OF THE COURSE: Training of early stage scientists, engineers and technicians in Spanish language. Contribution to conservation of Spanish technical vocabulary, specially the one related to VST.
- LANGUAGE: Spanish.
- COURSE OUTLINE ATTACHED: Yes. See Annex I.
- EXPECTED EDUCATIONAL AND JOB LEVEL OF STUDENTS:
PhD and Master students, lab technicians willing to count with a formal instruction in vacuum science and technology.
- EXPECTED AVERAGE NUMBER OF STUDENTS PER COURSE: 40
- FINANCES:
Cost per course in Euros: 2200
Sources and total amount of support (See Budget); Shared ASEVA and IUVSTA contributions
IUVSTA contribution requested and how will it be used.

ASEVA asks for 1100 € for the cofounding of next edition to cover the contribution from students (waived fees) and partially contribute to administrative and IT infrastructure.

- PROVISIONAL BUDGET ATTACHED: Yes. See Annex II.

REPORT:

The Society (the recipient of the grant) is required (within 1 month after the TTC completion) to send a Report to the IUVSTA Scientific Secretary which should include the following information: a) Title, location, and date of the TTC, b) Intent of the course, language of the course, c) List of teachers and attendants (with affiliations), d) Names of beneficiaries of the IUVSTA support, with spending specifications.

I agree to fulfil all the points of the above

Name: Miguel Manso Silván

Position: ASEVA President

Date and Signature: 16th March 2022.

Annex I

Course Outline:

Lecture 0. Relevancia del Vacío en Ciencia y Tecnología, Arantzazu Mascaraque, UCM, y Juan de la Figuera, CSIC, Madrid.

- Relevance of vacuum in Science and Technology.

Lecture 1. Vacío: historia y sus aplicaciones, José Abad, UPCT, Murcia.

- Vacuum; History and Applications.

Lecture 2. Fundamentos físicos del vacío, Roman Nevshupa, Torroja-CSIC, Madrid

- Vacuum physical fundamentals.

Lecture 3. Materiales para aplicaciones de vacío, Jorge García, INM-CSIC, Madrid

- Materials for vacuum applications.

Lecture 4. Bombas de vacío primario, Koen Lauwaet, IMDEA Nano, Madrid

- Primary vacuum pumps.

Lecture 5. Bombas turbomoleculares, Jorge Lobo, ICMA-CSIC, Zaragoza

- Turbomolecular pumps.

Lecture 6. Bombas de captura, Gustavo Ceballos, ICN2, Barcelona,

- Getters.

Lecture 7. Medidores de vacío total, Jesus Sobrado Vallecillo, INTA, Madrid

- Absolute vacuum measurement.

Lecture 8. Medidores de vacío parcial, Daniel Granados, IMDEA Nano, Madrid

- Partial vacuum measurement.

Lecture 9. Construyendo sistemas de vacío, Lidia Martínez, ICMM-CSIC, Madrid,

- Construction of vacuum systems.

Lecture 10. Preparación de muestras en vacío, Enrique Ortega, UPV, San Sebastián

- Preparation of samples in vacuum.

Lecture 11. Fabricación de materiales complejos que requieren vacío, Miguel Ángel González Barrio, UCM, Madrid

- Complex materials processing in vacuum.

Lecture 12. Plasma y vacío, María Carmen López Santos, ICMS-CSIC, Sevilla

- Plasmas and vacuum.

Lecture 13. Técnicas experimentales clásicas basadas en HV-UHV, Lucia Aballe, Alba, Barcelona

- Analytical techniques based in HV-UHV.

Lecture 14. Criogenia y UHV, Martina Corso, CFM, San Sebastián

- Cryogenics and UHV.

Lecture 15. Sistemas en grandes instalaciones, María Lucía Martínez Pérez, U. Zaragoza, Zaragoza,

- Vacuum systems in large infrastructures.

Lecture 16. Sistemas industriales, César Atienza, Catienza, Sevilla

- Industrial vacuum systems.

Lecture 17. Futuro del vacío: XHV, espacio y nuevas aplicaciones., Jose Angel Martín Gago, ICMM-CSIC, Madrid

- Future perspectives, XHV, the space and new applications.

Lecture 18. Presentación empresas ASEVA. I.

- Presentations by industrial associates.

Lecture 19. Presentación empresas ASEVA. II.

- Presentations by industrial associates.

Annex II

| Costs | rate (€) | number | TOTALS (€) | GRAND TOTAL (€) | Balance (€) |
|---|----------|--------|------------|-----------------|-------------|
| Administrative staff. Registration/website maintenance/diplomas | 60 €/h | 20 | 1200 | | |
| Contribution to zoom license and virtual campus | 400 | 1 | 400 | | |
| Souvenir for lecturers / post | 30 | 20 | 600 | | |
| | | | | 2200 | |
| Income | | | | | |
| Registration fee | 0 | 40 | 0 | | |
| ASEVA contribution | 1100 | 1 | 1100 | | |
| IUVSTA Contribution | 1100 | 1 | 1100 | | |
| | | | | 2200 | |
| | | | | | 0 |