ERASMUS+ BIP ESS-HPT, Graz University of Technology

A Successful Story: 30 Years of Summer Schools in High Pressure Technology

Graz University of Technology Austria

Organiser: Prof. Thomas GAMSE
Graz University of Technology

ERASMUS+ BIP ESS-HPT, Graz University of Technology

A Short History

ERASMUS+ BIP ESS-HPT, Graz University of Technology

Intensive Programms

1995 – 1997	SOCRATES IP:	"Current Trends in High Pressure Technology and Chemical Engineering"
1999 – 2001	SOCRATES IP:	"High Pressure Technology in Process and Chemical Engineering"
2002 – 2004	SOCRATES IP:	"High Pressure Chemical Engineering Processes: Basics and Applications"
2005 – 2007	SOCRATES IP:	"Basics, Developments, Research and Industrial Applications in High Pressure Chemical Engineering Processes"
2008 - 2010	Life Long Learning IP: SCF- GSCE	"Supercritical Fluids – Green Solvents in Chemical Engineering"

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Intensive Programms

2011 Intensive Course organised by EFCE Working Party
"High Pressure Technology"
"High Pressure Technology – From Basics to Industrial Applications"

2012 - 2014 Life Long Learning IP: PIHPT
"Process Intensification by High Pressure Technologies – Actual Strategies for Energy and Resources Conservation"

Intensive Programmes cancelled within ERASMUS+

2015 - 2022 Intensive Courses organised by EFCE Working Party
ESS-HPT "The European Summer School in High Pressure Technology"

University of Maribor / SI and Graz University of Technology / AT

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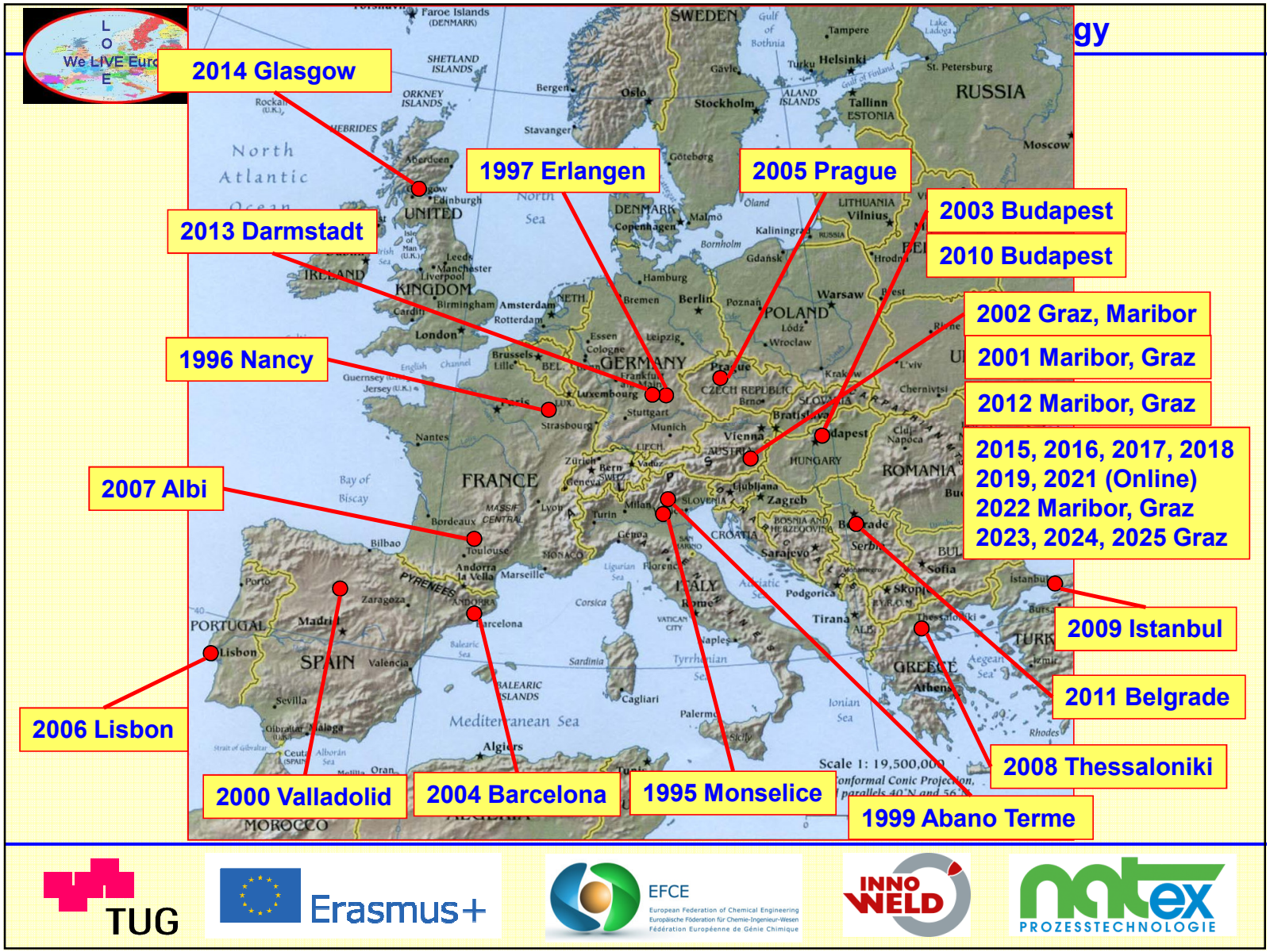
Intensive Programms

since 2023 ERASMUS+ BIP (Blended Intensive Programme)

2023 – 2025 **ERASMUS+ BIP ESS-HPT**
Graz University of Technology


2014 Glasgow
1997 Erlangen
2005 Prague
2003 Budapest
2010 Budapest
2013 Darmstadt
2002 Graz, Maribor
2001 Maribor, Graz
2012 Maribor, Graz
1996 Nancy
2015, 2016, 2017, 2018
2019, 2021 (Online)
2022 Maribor, Graz
2023, 2024, 2025 Graz
2007 Albi
2009 Istanbul
2011 Belgrade
2006 Lisbon
2008 Thessaloniki
2000 Valladolid
2004 Barcelona
1995 Monselice
1999 Abano Terme
TUG
Erasmus+
EFCE
European Federation of Chemical Engineering
INNO WELD
PROZESSTECHNOLOGIE

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Participating Universities

1995 **6 Universities**

- Graz University of Technology, AT
- University Erlangen-Nürnberg, DE
- Technical University Twente, NL
- University Padua, IT
- University Trieste, IT
- Ecole Nationale Superieure des Industries Chimiques, Nancy, FR
- University Maribor, SI

7 days Intensive Course

12 students

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ERASMUS+ BIP ESS-HPT 2025
"The European Summer School in High Pressure Technology

students from 15 European universities

total: 39 students with 16 different nationalities

28 ERASMUS+ Student Mobility for Studies

5 ERASMUS+ Staff Mobility for Training

6 additional students

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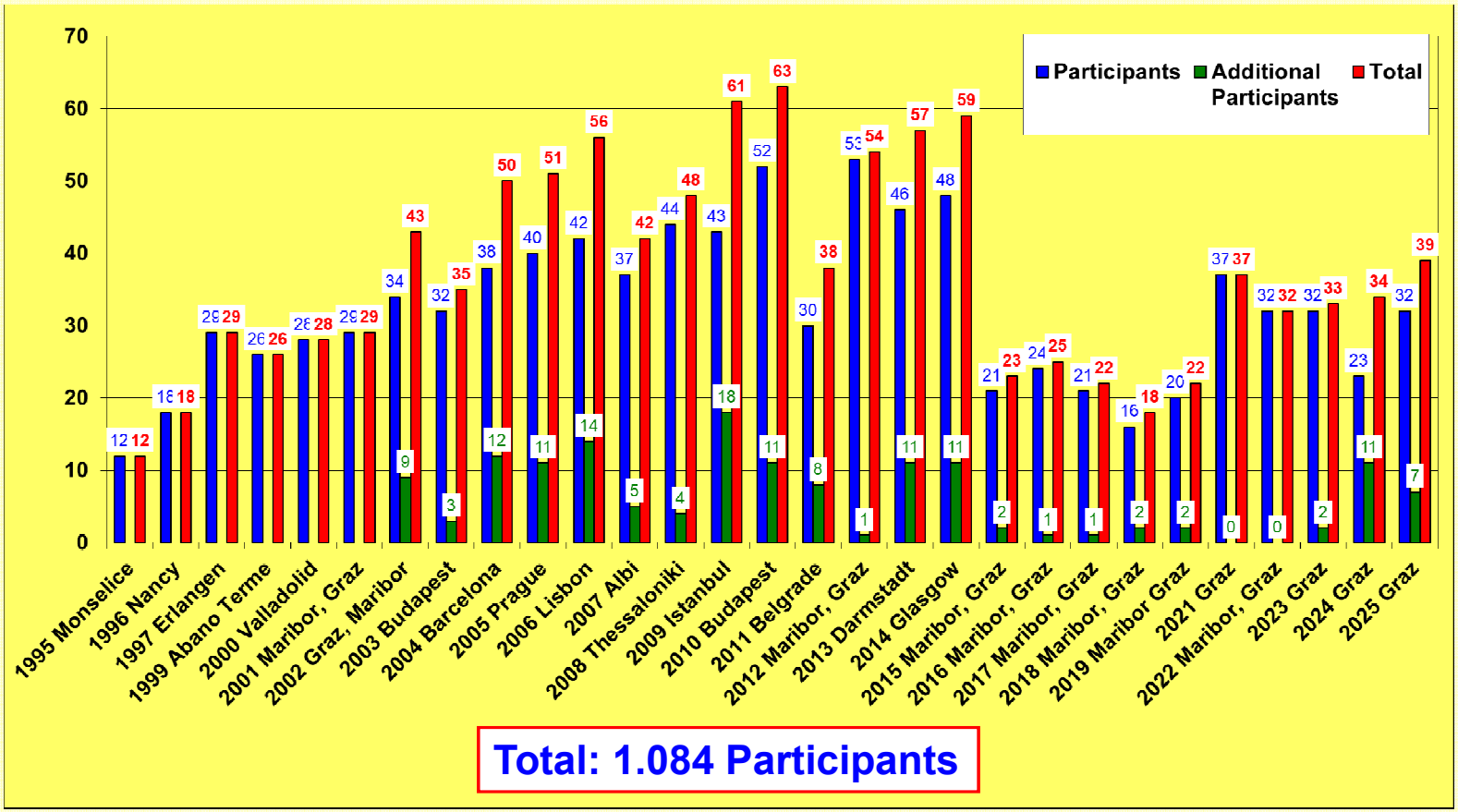

Total: 1.084 Participants

ERASMUS+ BIP ESS-HPT, Graz University of Technology

ERASMUS+ BIP ESS-HPT 2025
"The European Summer School in High Pressure Technology

students from 15 European universities

total: 39 students with 16 different nationalities
28 ERASMUS+ Student Mobility for Studies
5 ERASMUS+ Staff Mobility for Training
6 additional students

teachers from 16 European universities and 2 companies

25 teachers
(9 former IP participants)

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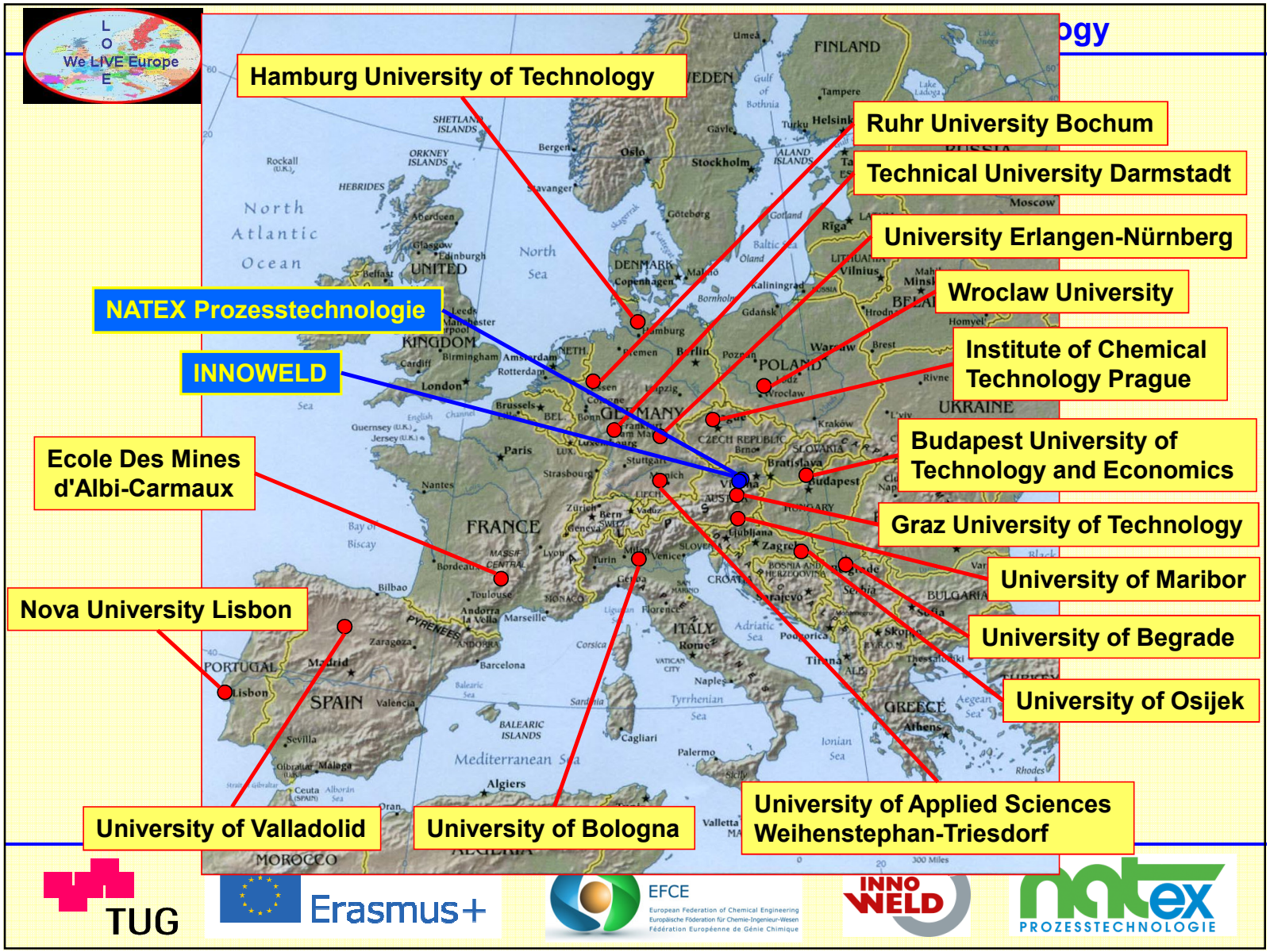
Hamburg University of Technology
Ruhr University Bochum
Technical University Darmstadt
University Erlangen-Nürnberg
Wroclaw University
Institute of Chemical Technology Prague
Budapest University of Technology and Economics
Graz University of Technology
University of Maribor
University of Begrade
University of Osijek
University of Applied Sciences Weihenstephan-Triesdorf
University of Bologna
University of Valladolid
Nova University Lisbon
Ecole Des Mines d'Albi-Carmaux
INNOWELD
NATEX Prozesstechnologie
We LIVE Europe
TUG
Erasmus+
EFCE
INNO WELD
natex PROZESSTECHNOLOGIE

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ERASMUS+ BIP ESS-HPT 2025
"The European Summer School in High Pressure Technology

Dates: 6.7.2025 – 19.7.2025 on-site presence

33 lectures a 90 minutes

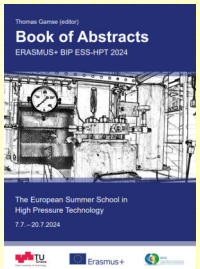
2 exams: group work for students (4 - 5 students per group)

2 excursions:

University of Maribor, Slovenia
visit of industries (NATEX Prozesstechnologie, INNOWELD)

student presentations:

10 min presentation of research work
night sessions (20:30 – 22:15)
abstracts are published in "Book of Abstracts"



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ERASMUS+ BIP ESS-HPT 2025 "The European Summer School in High Presssure Technology"
6.7. -19.7.2025, TU Graz
Online Phase 21.7. – 22.8.2025

	MORNING				AFTERNOON						
	8:30 - 9:15	9:25 - 10:10	10:30 - 11:15	11:25 - 12:10	13:15 - 14:00	14:10 - 14:55	15:15-16:00	16:10 - 16:55	17:00 - 17:45	17:55 - 18:40	
Sunday, 6 July 2025	Arrival									18:30 Registration	19:00 Welcome Dinner
Monday, 7 July 2025	Opening Short Introduction of each Participant	Oral Presentation Students (3)	HP Phase Equilibria - Modelling (Martin, Valladolid/ES)		HP Phase Equilibria - Experimental Methods (Knez-Marevci, Maribor/SI)		16:00 -17:30 guided tour Graz			Free time	Discussion + 20:30 Dinner
Tuesday, 8 July 2025	Supercritical Water Properties & Applications (Cocero, Valladolid/ES)		Exam 1 (Martin, Valladolid/ES)		Kinetics of High Pressure Chemical Reactions Including Benefits (Busch, Darmstadt/DE)		Application of Pressure and SCF Technology in a World Scale Process (Busch, Darmstadt/DE)		HP Phase Equilibria - Fundamentals (Bren, Maribor/SI)		Discussion + 20:30 Dinner
Wednesday, 9 July 2025	Extrusion Foaming of Polymers (Sauceau, Albi/FR)		Processing of Aerogels by Supercritical Fluid Technology and their Applications (Gurikov, Hamburg/DE)		Thermodynamic Aspects of Supercritical Fluid Chromatography (Gurikov, Hamburg/DE)		Biodiesel Synthesis under High Pressure (Stamenic, Belgrade/RS)		Free time	Discussion + 18:30 Dinner	20:30 - 22:15 Bar 8020 Oral Presentation Students (7)
Thursday, 10 July 2025	How to Design High Pressure Equipment (Schlücker, Erlangen/DE)		How to Design High Pressure Equipment (Schlücker, Erlangen/DE)		Transfer to Maribor	15:00 - 16:30 Visit of HP Lab Maribor		16:30 - 18:00 tour Maribor	18:00 - 20:00 Dinner Maribor		Transfer to Graz
Friday, 11 July 2025	How to Design High Pressure Equipment (Schlücker, Erlangen/DE)		Hydrogen (Schlücker, Erlangen/DE)		$HPCO_2$ Pasteurization and Drying of Food Products (Zambon, Bologna/IT)		Utilisation of Food Industry By-products for Sustainable Development using Supercritical CO_2 Extraction (Jokic, Osijek/HR)		Free time	Discussion + 18:30 Dinner	20:30 - 22:15 Bar 8020 Oral Presentation Students (7)
Saturday, 12 July 2025	Chemical Conversions under High Pressure (Müller, Bochum/DE)		Mass Transfer Limitations in Multiphase Reactions (Müller, Bochum/DE)		Free Time optionally: 14:00 - 17:00 Gin Seminar				Free time		
Sunday, 13 July 2025	Free Time										
Monday, 14 July 2025	Supercritical Fluids in Process and Product Design – From Bench Scale to Pilot Plants (Petermann, Bochum/DE)		Kinetics of SCF Extraction of Compounds from Plants and Microalgae (Sovova, Prague/CZ)		SCF Extraction of Solid Materials - Design Criteria from Lab Scale to Industrial Scale Plants (Gamse, Graz/AT)		Tutorials in HP Separation Processes for Process Intensivation (Gamse, Graz/AT)		Free time	Discussion + 18:30 Dinner	20:30 - 22:15 Bar 8020 Oral Presentation Students (7)
Tuesday, 15 July 2025	Transfer to NATEX Prozesstechnologie		Design and Layout of Closure Systems and Sealings for High Pressure Vessels (Lack)		Visit of NATEX Prozess-technologie GmbH	Transfer to Innoweld	Visit of INNOWELD Company	Transfer to Graz	17:30 - 20:00 Dinner Graz		
Wednesday, 16 July 2025	Countercurrent SCF Extraction - Comparison and Pros to Conventional Processes (Zetzl, Hamburg/DE)		Innovative Supercritical Separation Processes for Energy and Resource Reduction (Zetzl, Hamburg/DE)		Supercritical Fluids in the Oil and Gas Industry (Székely, Budapest/HU)		Exam 2		Free time	Discussion + 18:30 Dinner	20:30 - 22:15 Bar 8020 Oral Presentation Students (7)
Thursday, 17 July 2025	HP Particle Generation - Pros and Cons to Conventional Processes (Knez, Maribor/SI)		HP Enzymatic Processes - Advantages to Organic Solvents (Knez, Maribor/SI)		Application of CO_2-Extracts in Food and Cosmetic Industry (Grüner-Lempart, Freising/DE)		Impregnation and Grafting in Supercritical CO_2 - Challenges and Prospects (Zizovic, Wroclaw/PL)		Free time	Discussion + 18:30 Dinner	20:30 - 22:15 Bar 8020 Oral Presentation Students (7)
Friday, 18 July 2025	CO_2 Capture and Utilisation (Nunes, Lisbon/PT)		Supercritical Fluid Extraction and Separation of Active Components from Medicinal Plants (Vagi, Budapest/HU)		From Sampling to Analysis (Perva, Maribor/SI)		Preparation Final Exam		Free time		20:00 Farewell Dinner
Saturday, 19 July 2025	ESS-HPT Closing Ceremony	Departure									

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ERASMUS+ BIP ESS-HPT 2025
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Dates: 21.7.2025 – 22.8.2025 virtual phase

project work:

group work for students (4 - 5 students per group)

student have to organize themselves

effective work load: 3 – 5 working days

support from responsible teacher

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ERASMUS+ BIP ESS-HPT 2025
"The European Summer School in High Pressure Technology

Final mark = marks of 2 exams + mark of project work

Certificate including mark and 5 ECTS credits signed by all teachers


CERTIFICATE

attended the ERASMUS+ BIP ESS-HPT 2024
"The European Summer School in High Pressure Technology"
Graz University of Technology, Austria
7th July – 20th July 2024
and passed all the examinations with mark .....
(F = 0 - 50%, D = 51 - 65%, C = 66 - 80%, B = 81 - 90%, A = 91 - 100%)
This course corresponds to 5 ECTS-credits.

Prof. T.Gamse, Prof. U.Bren, Dr. C.Zetzl, Prof. A.Martin, Prof. M.Petermann, Prof. T.Müller, Prof. Stamenic, Prof. M.J.Cocero, Prof. E.Schlücker, Prof. M.Busch, Dr. H.Sovova, Prof.I.Zizovic, Prof. Z.Knez, Dr. E.Lack, Prof. M.Sauceau, Prof. P.Gurikov, Prof. S.Grüner-Lempart, Prof. E.Szekely, Dr A.Perva, Dr. E.Vagi, Dr. A.Nunes

ERASMUS+ BIP ESS-HPT, Graz University of Technology

What makes ERASMUS+ BIP a great success?

intensive interaction of participating students

- come together of students from different universities and countries
- intensive contact during 14 days course
- intensive discussions on research but also social topics




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What makes ERASMUS+ BIP a great success?

intensive interaction of students and teachers

intensive discussions on research topics

creating ideas of student exchanges

ERASMUS+ BIP ESS-HPT, Graz University of Technology

What makes ERASMUS+ BIP a great success?

intensive interaction of participating teachers

duration of stay: 3 – 5 days

relaxing atmosphere and much time for discussions

intensive discussions on research

creating new ideas of collaboration and common research projects

ERASMUS+ BIP ESS-HPT, Graz University of Technology

Challenge issues organising a ERASMUS+ BIP

start BIP with colleagues you know personally

- good contact, easy communication
- receiving necessary information in time
- fix date lines for students and teachers

include ERASMUS+ offices at each university from the beginning

- necessary for set-up and signing of bilateral contracts
- fix number of participating students and teachers
  - → depends on available budget at each university

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Challenge issues organising a ERASMUS+ BIP

limited budget for students

for Austria: daily rate = € 70,00 to € 75,00

find suitable accommodations

fix places for common lunches and dinners

→ ask for special food requirements




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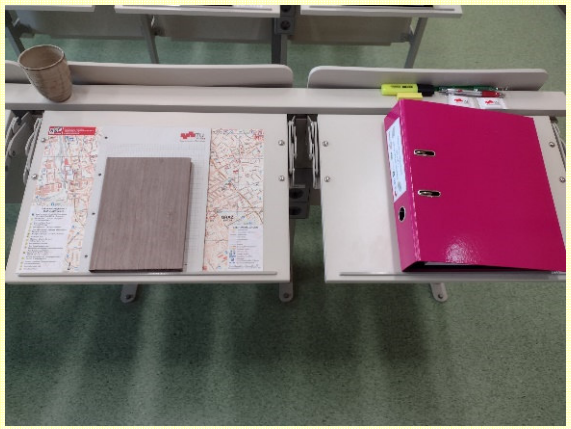
Challenge issues organising a ERASMUS+ BIP

limited budget for organization costs

depends on number of ERASMUS+ students

set-up a budget plan (costs for lecture room, copy lecture material, tickets for public transport, name tags, USB-sticks, coffee breaks, visiting tours, ...)



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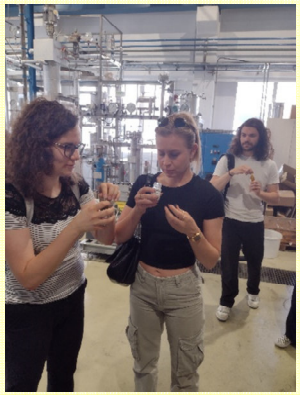
Most positive experience of an ERASMUS+ BIP

every year a new group of students

different countries and nationalities, social background, ...

merging to one homogeneous group

creating long-lasting friendships

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