

# STUDY GUIDE

## ***Porous Materials***

**Organised by**

**Brandenburg University of  
Technology Cottbus-Senftenberg**

| 1. IDENTIFYING DATA.             |   |            |
|----------------------------------|---|------------|
| · Course Name.                   | Porous Materials  |            |
| · Coordinating University.       | Brandenburg University of Technology Cottbus-Senftenberg, Germany   |            |
| · Partner Universities Involved. |   |            |
| · Course Field(s).               | Chemistry / Engineering: Energy, Transport/Mobility   |            |
| · Related Study Programme.       |   |            |
| · ISCED Code.                    | ISCED Code 7 (Master or equivalent level)   |            |
| · SDG.                           | SDG 7 - Affordable and clean energy   |            |
| · Study Level.                   | <b>Master</b><br>Course is also open to: (Bachelor (BA), PhD students (D) & staff   |            |
| · EUNICE Key Competencies        | Key Competencies offered by the course. <ul style="list-style-type: none"> <li>• Green – strongly</li> <li>• Orange - moderately</li> <li>• Red – partially</li> <li>• Blank cell - not at all</li> </ul> |            |
|                                  | Problem solving   | not at all |
|                                  | Teamworking   | not at all |
|                                  | Communication   | not at all |
|                                  | Self-management   | strongly   |
|                                  | Cognitive flexibility   | strongly   |
|                                  | Digital competence  | moderately |
|                                  | Technical competence  | moderately |

|  |                                 |            |
|--|---------------------------------|------------|
|  | Global intercultural competence | not at all |
|--|---------------------------------|------------|

|                                     |   |
|-------------------------------------|---|
| · Number of ECTS credits allocated. | 6   |
| · Mode of Delivery.                 | Online self-study   |
| · Language of Instruction.          | English   |
| · Course Dates.                     | 05 October, 2026 – 31 January, 2027   |
| · Precise Schedule of the Lectures. | Self organised studies / 165 Hours<br>Online live-Seminar on demand / 1 Hours per Week per Semester |
| · Key Words.                        | chemistry porous materials  |
| · Catchy Phrase.                    | The course deals with the synthesis, characterization and application of highly porous materials.   |

|   |  |
|---|--|
| · Prerequisites and co-requisites.                      | - comprehensive knowledge in chemistry and physics<br>- Master (M) / Doctorate (D) |
| · Number of EUNICE students that can attend the Course. | 20 (2 per partner university)  |
| · Course inscription procedure(s).                      | EUNICE platform  |

## 2. CONTACT DETAILS.

|                     |                              |
|---------------------|------------------------------|
| · Department.       | Chair Technical Chemistry    |
| · Name of Lecturer. | Prof. Dr. habil. Olaf Klepel |
| · E-mail.           | olaf.klepel@b-tu.de          |
| · Other Lecturers.  |                              |

## 3. COURSE CONTENT.

- nature of porosity
- textural characterization of porous materials by adsorption methods
- material classes: zeolites, activated carbons, silica gel, porous glass, metal organic frameworks, porous polymers, ordered mesoporous material, membranes

#### 4. LEARNING OUTCOMES.

The students acquire comprehensive knowledge on important classes of porous materials, their preparation and characterization. By studying original scientific literature on their own, students are able to analyse scientific texts and reflect on their content in the context of the lecture material.

#### 5. OBJECTIVES.

Graduates are qualified to work on scientific tasks in the field of porous materials.

#### 6. COURSE ORGANISATION.

##### UNITS

- |    |  |
|----|--|
| 1. | Characterisation of porous materials   |
| 2. | Important classes of porous materials: Silicatic materials, porous carbons, metal organic frameworks, porous glasses, porous polymers) |
| 3. |  |
| 4. |  |

##### LEARNING RESOURCES AND TOOLS.

videos

##### PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.

self-study videos, online-seminars on demand

#### 7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

Final module examination: Written exam, 120 min  
The course is graded (1 excellent – 5 insufficient).

##### OBSERVATIONS.

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS.

Handbook of porous Solids, Editor(s): F. Schüth, K.S.W. Sing, J. Weitkamp, WILEY-VCH, (2002), ISBN:9783527302468, DOI:10.1002/9783527618286