

| <b>Module:</b> Electron structure methods   |   |  |  |
|---|---|--|--|
| <b>University/department/institute:</b> Freie Universität Berlin/Department of Biology, Chemistry and Pharmacy/Institute of Chemistry and Biochemistry  |   |  |  |
| <b>Responsible for the module:</b> module lecturers   |   |  |  |
| <b>Admission requirements:</b> none   |   |  |  |
| <b>Qualification aims:</b> The students have detailed knowledge of the theoretical and experimental principles of electron structures for periodic systems. They can determine the electronic band structure of a crystal using theoretical and experimental methods and can interpret the band structure using symmetry arguments; they are able to derive solid state properties from their findings. |   |  |  |
| <b>Content:</b> Crystal structure and space groups; quantum chemistry for periodic systems; spectroscopic methods of determining electron structure, e.g. angle-resolved photoemission spectroscopy, scanning tunnelling spectroscopy, inverse photoemission, 2-photon photoemission  |   |  |  |
| <b>Teaching and learning units</b>  | <b>Attendance</b><br>(Semester hours per week = SH) | <b>Forms of active participation</b>             | <b>Study time</b><br>(hours)   |
| Lecture   | 2   | -  | Attendance L 30<br>Preparation and follow-up L 30  |
| Seminar on the computer using special software  | 2   | Working on problem sets and computer simulations | Attendance SPC 30<br>Preparation and follow-up SPC 30<br>Examination preparation, examination 30 |
| <b>Language of instruction</b>  |   | German or English                                |  |
| <b>Compulsory regular attendance</b>  |   | Lecture: attendance recommended; seminar: yes    |  |
| <b>Study time, total hours</b>  |   | 150 hours  | 5 CP   |
| <b>Duration of module</b>   |   | One semester                                     |  |
| <b>Module offered</b>   |   | Not regularly                                    |  |
| <b>Application</b>  |   | Master's program in Chemistry                    |  |