Product isolation	
Code	(not yet made available)
Credits (as per ECTS)	8
Attendance time	6 SWS
Course language	German (5th Semester), English (4th Semester)
Duration	2 Semester
Rota	annually
Module coordinator	Prof. Dr. Ebert
Assistant professor(s)	Prof. Dr. Ebert
Incorporation in the degree programs	Industrial biotechnology BSc, mandatory module, 4th and 5th semester
Required knowledge	• Content: Recommendations: Biochemistry
Learning outcomes	Students that have successfully completed this module, • are capable of analysing and characterising biomolecules • can practically implement precipitation methods, protein crystallisation, ion-exchange chromatography and tangential flow filtrations • can characterise biomolecules via the measurement of enzyme activities • can determine the purity of protein solutions • can biologically process biomolecules
Content	The following technical contents are taught in this module: Lecture "Product isolation" • Introduction to the preparation of biomolecules • Methods of cell isolation • Fundamentals of chromatography • Chromatographic separation processes for separation of biomolecules • Radial and continuous chromatography • Precipitation and crystallisation • Filtering methods • Two-phase systems for separation of biomolecules Practical course "Product isolation practical course" • Cell isolation via ultrasound probe and high pressure homogeniser • Determination of binding conditions of a protein using DOE on various ion exchange resins under various conditions in 96-well scale ("resin-screening") • Chromatography for enzyme enrichment using the laboratory standard affinity (His-tag) and ion exchange chromatography • Determination of enzyme activities, protein analysis using SDS-PAGE, total protein content determination • Crystallisation of a protein • Tangential flow filtration
Literature	Lecture "Product isolation"

	• Lecture notes Practical course "Product isolation practical course" • Lecture notes
Forms of teaching and learning	• Product isolation (V), 2 SWS, 2 LP, 4th Semester • Product isolation practical course (P), 4 SWS, 6 LP, 5th Semester,
Workload	**Lecture "Product isolation"** Attendance time: 30 h Individual study: 30 h **Practical course "Product isolation practical course"** Attendance time: 60 h Individual study: 120 h **Total** Attendance time: 90 h Individual study: 150 h Total: 240 h
Evaluation method	The evaluation is a written exam (60 minutes) covering the entire module. Participation in this written examination requires students to have successfully completed the prerequisite "Product isolation practical course (P)" (written composition, protocols).
Grading	The module grade corresponds to the result of the examination.