BSPS IN COSMETIC SCIENCE AND FORMULATION DESIGN (PCOS)

The Cosmetic Science and Formulation Design major is an interdisciplinary program involved with developing, formulating, producing, and testing cosmetics and personal care products. The major places a strong emphasis on the design and formulation of personal care and beauty products, and as part of their experience, students formulate 50+ personal care and cosmetic products in the laboratory during their studies. Cosmetic science majors also study the art and business of cosmetics in various elective and required courses. Additionally, students in this major learn about regulations and how to assess products' safety, performance and quality.

BSPS Internship Description

A 400-hour internship experience is required to be completed for those who are enrolled within the Bachelor of Science in Pharmaceutical Sciences Program (non-PharmD). Internships must be related to the pharmaceutical sciences industry and may take place within a variety of local, regional, national, and international sites. Career coaching is provided to help students throughout the internship search process (e.g., resume writing, employer outreach, interview preparation, etc.). The internship experience typically occurs during the summer after P1 year, and the course grade is determined through a combination of supervisor evaluations and course assignments.

Cosmetic Science and Formulation Design Pipeline Program to MS in Cosmetic Science and Formulation Design - An example is attached in other documents

List of Courses for PH-PCOS-BSS - Cosmetic Science and Formulation Design, BSPS – Pre Professional and Professional Years

Pre Professional

Code	Title	Hours
PHPR 1000	Orientation	1
MATH 1850	Single Variable Calculus I	4
CHEM 1230	General Chemistry I	0,4
CHEM 1280	General Chemistry Lab I	1
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
PHCL 2610	Introductory Physiology	3
MATH 2640	Statistics for Applied Science	3
CHEM 1240	General Chemistry II	0,4
CHEM 1290	General Chemistry Lab II	1
ENGL 1110	College Composition I	3
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
PHYS 1750	Introduction To Physics	4
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
CHEM 2420	Organic Chemistry II	3
CHEM 2470	Organic Chemistry Laboratory II for Non-Majors	1
Diversity of US		
Non-Diversity of US		
Social Science Core		
Social Science Core		
Arts/Humanities Core		
Arts/Humanities Core		

Professional

Code	Title	Hours
PHPR 2040	Introduction to Cosmetic Science	1
PHPR 3010	Pharmaceutical Calculations	2
PHPR 3020	Pharmaceutics I	3
PHPR 3110	Pharmaceutics Lab I	1
PHPR 3040	Cosmetic Ingredients	2
PHPR 3240	Cosmetic Ingredients Laboratory	1
PHM 3700	Career Planning Strategies	1
PSLS 3000	Sales Career Orientation And Management	1
MBC 3310	Medicinal Chemistry I: Drug Action And Design	2
PHPR 3030	Pharmaceutics II	3
PHPR 3120	Pharmaceutics Lab II	1
PHPR 4730	Cosmetic Science I	3
PHPR 4740	Cosmetic Science Laboratory I	1
BUAD 3010	Principles Of Marketing [4]	3
PHPR 4890	Internship in Cosmetic Science and Formulation Design	3-6
MBC 3330	Techniques in Pharmaceutical and Medicinal Chemistry	2
MBC 3340	Techniques in Pharmaceutical and Medicinal Chemistry Laboratory	1
MBC 3550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules	3
PHPR 4750	Cosmetic Science II	3
PHPR 4760	Cosmetic Science Laboratory II	1
PHCL 3700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
MBC 3860	Microbiology for Pharmaceutical Professionals	2
PHCL 4160	Biopharmaceutics & Pharmacokinetics	3
Cosmetic Science elective		
Cosmetic Science elective		

Combined bachelor's to master's for MS in Cosmetic Science and Formulation Design

List of Courses for PH-PCOS-BSPS 4+1 pathway to the MS in Cosmetic Science and Formulation Design

Courses listed above for the PH-PCOS-BSPS Pre Professional and Professional Years plus the three courses (3 credit hours each) listed below for the 4+1 Pathway Program

Code	Title	Hours
PHPR 5800	Cosmetic Ingredients and Product Forms	3
PHPR 5820	Cosmetic Trends and Claims	3
PHPR 5830	Cosmetic Regulations, Ethics, and Practices	3

Below is a sample plan of study. Consult your degree audit for your program requirements.

BSPS Cosmetic Science and Formulation Design MAJOR Curriculum (FOR P1 STUDENTS ENTERING IN FALL 2023 AND AFTER)

PREPROFESSIONAL

First Term		Hours
PHPR 1000	Orientation	1
MATH 1850	Single Variable Calculus I *	4
CHEM 1230	General Chemistry I *	4
CHEM 1280	General Chemistry Lab I	1
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
	Hours	**15**
Second Term		
PHCL 2610	Introductory Physiology	3
MATH 2640	Statistics for Applied Science *2	3
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
ENGL 1110	College Composition I	3
Diversity of US [3]		3
	Hours	**17**
Third Term		
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
PHYS 1750	Introduction To Physics [1]	4
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
Social Sciences Core		3
	Hours	**14**
Fourth Term		
CHEM 2420	Organic Chemistry II	3
CHEM 2470	Organic Chemistry Laboratory II for Non-Majors	1
Social Sciences Core		3
Arts/Humanities Core		3
Arts/Humanities Core		3
Non#US Diversity [3]		3

1 Only offered during fall semesters 2 Not required prior to P1 for BSPS-only applicants 3 If double-dip, PREP courseload reduced by 3 hours. Only one double dip is allowed for the UT Core requirements. * Students accepted into the College of Pharmacy and Pharmaceutical Sciences should be academically prepared to be placed into MATH 1850 and CHEM 1230. Students placing into a lower math level - MATH 1200, MATH1320 or MATH1750 and/or placing into a lower level chemistry - CHEM 1090 (based on students' testing scores) will require additional hours for graduation.

	Hours	**16**
	Total Hours	**62**

Students should consult their Degree Audit for coursework that fulfills elective course requirements in the General Education/Core area.

PROFESSIONAL

Fifth Term		Hours
PHPR 2040	Introduction to Cosmetic Science [1]	1
PHPR 3010	Pharmaceutical Calculations	2
PHPR 3020	Pharmaceutics I	3
PHPR 3110	Pharmaceutics Lab I	1
PHPR 3040	Cosmetic Ingredients	2
PHPR 3240	Cosmetic Ingredients Laboratory	1
PHM 3700	Career Planning Strategies	1
PSLS 3000	Sales Career Orientation And Management	1
MBC 3310	Medicinal Chemistry I: Drug Action And Design	2
	Hours	**14**
Sixth Term		
PHPR 3030	Pharmaceutics II	3
PHPR 3120	Pharmaceutics Lab II	1
PHPR 4730	Cosmetic Science I	3
PHPR 4740	Cosmetic Science Laboratory I	1
BUAD 3010	Principles Of Marketing [4]	3
Cosmetic Science Elective [3]		3
	Hours	**14**
Seventh Term		
PHPR 4890	Internship in Cosmetic Science and Formulation Design [2]	3-6
	Hours	**3-6**
Eighth Term		
MBC 3330	Techniques in Pharmaceutical and Medicinal Chemistry	2
MBC 3340	Techniques in Pharmaceutical and Medicinal Chemistry Laboratory	1
MBC 3550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules	3
PHPR 4750	Cosmetic Science II	3
PHPR 4760	Cosmetic Science Laboratory II	1

PHPR 4770	Advanced Drug Delivery Systems – I	3
PHCL 3700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology	3
	Hours	**16**
Ninth Term		
MBC 3860	Microbiology for Pharmaceutical Professionals	2
PHCL 4160	Biopharmaceutics & Pharmacokinetics	3
Cosmetic Science Electives [3]		9
	Hours	**14**
	Total Hours	**61-64**

[1] If not taken during pre-professional division.
[2] 3 credit hours are required, and an additional 1-3 credit hours can be taken. The additional credit hours cannot be used as Cosmetic Science elective hours.
[3] See Cosmetic Science elective list.
[4] Students interested in Cosmetic Science and Formulation Design will need to take ECON 1200 for one of the Social Science Core courses.

Cosmetic Science and Formulation Design Electives (must take 12 credits from the list):

A minimum of 6 credits must come from the following elective courses:

Code	Title	Hours
PHPR 2020	Careers in Cosmetic Science	1
PHPR 3100	Emulsion Science	1
PHPR 3500	Cosmetic Laws and Regulations	1
PHPR 3620	Cosmetic and Fragrance Product Development	1
PHPR 4820	Advanced Formulation Techniques	1
PHPR 4900	Honors Seminar In Pharmacy Practice	1-3
PHPR 4910	Pharmacy Practice Problems	1-5
PHPR 4940	Skin Care Science	1
PHPR 4960	Honors Thesis In Pharmacy Practice	2-5
CHEM 3730	Physical Chemistry I	3
CHEM 3740	Physical Chemistry II	3
ECON 4750	Health Economics	3
ECON 3240	Environmental Economics	3
HEAL 2800	Principles Of Nutrition	3
HEAL 3500	Environmental Health	3
BIOL 3030	Cell Biology	3
BIOL 3040	Cell Biology Laboratory	2
ART 1050	Foundations of 2D Design	3
CMPT 2410	Adobe InDesign Desktop Publishing	3
MBC 3552	Physiological Chemistry II Cellular Metabolism and Homeostasis	2
MBC 3560	Physiological Chemistry II: Chemical Regulation Of Cells And Organisms	3
MBC 4380	Medicinal Plants	3

Up to 6 credits may come from the following courses:

Code	Title	Hours
PSLS 3440	Professional Sales	3
PSLS 3450	Sales Technologies and Strategies	3
PSLS 4740	Advanced Sales	3
PSLS 3080	Purchasing And Business Relationship Management	3
PSLS 4710	Salesforce Leadership	3
MKTG 4540	Business Marketing	3
MKTG 3690	Marketing Communications	3
MKTG 3850	Buyer Behavior And Relationship Marketing	3

Code	Title	Hours
Preprofessional		62
Professional		61
Please Note: If double-dip one of the UT Core courses, the courseload will be reduced from 123 to 120.		
Total Hours		**123**

BSPS COSMETIC SCIENCE AND FORMULATION DESIGN MINOR CURRICULUM

Required core courses (4 courses totaling 9 credit hours required)

COLLEGE OF PHARMACY AND PHARMACEUTICAL SCIENCES

Code	Title	Hours
PHPR 2040	Introduction to Cosmetic Science (Fall)	1
PHPR 3040	Cosmetic Ingredients (Fall)	2
PHPR 4730	Cosmetic Science I (Spring)	3
PHPR 4750	Cosmetic Science II (Fall)	3

ELECTIVE COURSES (Select 6 credit hours)

COLLEGE OF NATURAL SCIENCES AND MATHEMATICS

Code	Title	Hours
CHEM 3510	Biochemistry I (Fall)	3
CHEM 3610	Inorganic Chemistry I (Spring)	3
CHEM 4720	Modern Topics in Physical Chemistry (Spring)	4
CHEM 4200	Green Chemistry (Fall)	3
CHEM 4810	Materials Science I (Fall)	4
CHEM 4820	Materials Science II (Spring)	4

COLLEGE OF ENGINEERING

Code	Title	Hours
CHEE 4800	Polymer Science And Engineering (Fall)	3
CHEE 4960	Senior Honors Thesis (Fall, Spring & Summer)	3
CHEE 4980	Special Topics In Chemical Engineering (Fall, Spring & Summer)	1-4
CHEE 4990	Independent Studies In Chemical Engineering (Fall, Spring & Summer)	1-4

COLLEGE OF PHARMACY AND PHARMACEUTICAL SCIENCES

Code	Title	Hours
PHCL 3700	Pharmacology I: Principles of Pharmacology, Autonomic Pharmacology and Related Pharmacology (Fall)	3
MBC 3550	Physiological Chemistry I: Structure And Function Of Biological Macromolecules (Fall)	3
MBC 3560	Physiological Chemistry II: Chemical Regulation Of Cells And Organisms (Spring)	3
MBC 3330	Techniques in Pharmaceutical and Medicinal Chemistry (Fall)	2
MBC 3340	Techniques in Pharmaceutical and Medicinal Chemistry Laboratory (Fall)	1
PHCL 4160	Biopharmaceutics & Pharmacokinetics	3

Combined bachelor's to master's for MS in Cosmetic Science and Formulation Design

Code	Title	Hours
PHPR 5800	Cosmetic Ingredients and Product Forms	3
PHPR 5820	Cosmetic Trends and Claims	3
PHPR 5830	Cosmetic Regulations, Ethics, and Practices	3

Combined Bachelor's To Master's - Cosmetic Science And Formulation Design, BSPS To MS In Cosmetic Science And Formulation Design

Undergraduate students accepted to the University of Toledo's Cosmetic Science and Formulation Design Pipeline Program option will be admitted to the MS in Cosmetic Science and Formulation Design and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue into the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: The courses are listed above for the PH-PCOS-BSPS Pre-Professional and Professional Years. For the 4+1 Pathway Program 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) take the following 3 courses 1) PHPR 5800 Cosmetic Ingredients and Product Forms, 2) PHPR 5820 Cosmetic Trends and Claims, and 3) PHPR 5830 Cosmetic Regulations, Ethics, and Practices instead of three PCOS elective courses equaling 9 credits hours. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Learning Outcomes

- PLO 1. Communicate effectively and work cooperatively in both disciplinary and interdisciplinary teams.
- PLO 2. Apply pharmaceutical sciences and cosmetic science knowledge and skills to evaluate and solve problems.
- PLO 3. Assess the physicochemical and biological properties and function of ingredients in cosmetics and drug products.
- PLO 4. Use techniques and procedures related to the formulation, testing, and quality assurance of cosmetics and drugs to design stable, safe, and effective products.
- PLO 5. Apply formulation and documentation practices and current regulatory requirements that govern the registration, manufacturing, testing, labeling, and advertising of cosmetics and drugs in the United States.