

**BS in Pharmaceutical Science (BSPS) degree program**  
**University of Rhode Island**

120 credits required, Average 15 credits per semester
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To prepare students for careers in the pharmaceutical, biotechnical, consumer product and health care industries. Types of work include laboratory, regulatory oversight, engineering, economics, marketing, and business related to these industries. Also prepares students for advanced degrees MS, PhD in sciences; Medical Doctor (MD, DO); Dentistry (DDS, DMD); Veterinary (DVM); Law (JD); Business (MBA).

The curriculum contains four distinct components. The first component consists of 44 credits of basic science and mathematics pre-requisite courses that will deliver a firm foundation in the sciences, and satisfy admission requirements for most basic science graduate programs and professional schools. The second component consists of 28 credits of general education requirements that will provide a broad exposure to the humanities, arts, language and social sciences. The third component is the BSPS core requirement, consisting of 32 credits of new and existing BPS/PHP courses, which will offer students a strong basic and applied understanding of the pharmaceutical sciences. The fourth component of 16 credits, comprising BSPS electives, is drawn from upper level BSPS courses and selected electives from other programs on campus, particularly those from the sciences and business. These courses allow our students to tailor a program of study to suit their specific career goals, with the approval of the BSPS Advisor. There are no requirements for certification or licensing associated with the BSPS degree.

**Strong Foundation in Basic Sciences (44-45 credits)**

General Chemistry I, General Chemistry <b>Lab I</b>	CHM101 (3), CHM102 (1)
General Chemistry II, General Chemistry <b>Lab II</b>	CHM112 (3), CHM114 (1)
Organic Chemistry I & II, Organic Chemistry <b>Lab</b>	CHM227 (3), CHM228 (3), CHM226(2)
General Physics I, Physics I <b>Lab</b>	PHY111 (3), PHY185 (1)
General Biology with <b>lab</b>	BIO101 (3), BIO103 (1)
Human Anatomy with <b>lab</b>	BIO121 (4)
Human Physiology (lab is optional)	BIO242 (3)
Medical Microbiology with <b>lab</b>	MIC201 (4)
Introductory Biochemistry	BCH311 (3)
Applied Calculus or Introductory Calculus	MTH131 (3) or MTH141 (4)
Introductory Research Statistics	STA308 (3)

1<sup>st</sup> and 2<sup>nd</sup> year

**General Education for well-rounded students (16 credits during year 1-2; 12 cr during yr 3-4)**

Communications, Research Writing, URI 101	COM100 (3), WRT106 (3), URI101 (1)
Microeconomics	ECN201 (3)
General Education Choices	6 credits during yr 1-2; 12 cr. during yr 3-4

**Core BSPS Courses and labs (32 credits)**

Dosage Forms I: Regulation and Biopharmaceutics (Fall)	BPS 301(2)
Dosage Forms II, III: Solid, Solution, Special (Fall only)	BPS 303 (2), and 305 (2)
Immuno-inflammatory Disease (Fall only)	BPS311 (2)
Principles of Medicinal Chemistry (Fall only)	BPS313 (2)
Principles of Pharmacology & Autonomic (Fall only)	BPS321 (2)
Drug Metabolism and Bioanalysis (Spring only)	BPS325 (2)
Good Manufacturing Practices (GMP) (Spring only)	BPS425 (3)
Formulation and Manufacturing <b>Lab</b> (Spring only)	BPS443 (2)
Pharmacology -Veterinary (spring)	BPS340 (3)
Pharmacogenomics and Pharmacogenetics (Fall only)	BPS442 (3)
Medicinal Chemistry & Molecular Biology <b>Lab</b> (Fall)	BPS451 (4)
Pharmacokinetics for Scientists I (Fall only)	BPS503 (3)

3<sup>rd</sup> and 4<sup>th</sup> year

**BSPS Electives for Individual Focus Areas (minimum 15-16 credits)**

Program of study developed for each student based on career objectives.

Example focus areas:

Natural Products	Pharmacology
Medicinal Chemistry	Toxicology
Pharmacoeconomics	Pharmaceutics

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**Develop a Program of Study with guidance of faculty advisor (use p.3 worksheet).**

**Choose minimum 15 credits from the list below.** (alternate courses may be approved on individual basis).

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**College of Pharmacy**

**Human Disease/Pharmacology**

BPS 436 (3) Psychotropic Drugs and Therapy, Fall, Spring  
BPS 535 (3) Pharmaceutical Biotechnology, Spring even years  
BPS 546 (3) Advanced Toxicology  
BPS 587 (3) General Pharmacology (Spring '12)

BPS 504 (3) Pharmacokinetics for Scientists II  
BPS 530 (3) Advanced Drug Metabolism, Spring odd yr

**Medicinal/Natural Products/Organic Chemistry**

BPS 445 (3) Natural Products and Biotech Drugs  
BPS 533 (3) Medicinal Plants, Fall  
BPS 521 (3) Cancer Chemotherapy & Toxicology, Spring  
BPS 551 (3) Chemistry of Natural Products, Spring  
BPS 545 (3) Advanced Medicinal Chemistry, Fall  
BPS 455 (3) Protein Molecular Modeling in BPS, Fall  
BPS 557x (3) Modern Spectroscopy in Drug Discovery

**Regulatory Affairs/Pharmacovigilance/Marketing**

PHP 405 (4) Epidemiology of Health Care, Spring  
PHP 540 (3) Princi, Meth & Apps of Epidemiology, Spring  
PHP 550 (3) Pharmacoepidemiology, fall  
PHP 580 (3) Pharmaco-economic Analysis, odd fall yrs.

**Pharmaceutics/Manufacturing/Formulations**

BPS 405 (3) Physical Pharmacy

**Bioinformatics**

BPS 542 (3) Bioinformatics I (every Spring)  
BPS 455 (3) Protein Molecular Modeling in BPS, Fall

**Every Specialty**

PHC 502 (3) Drug Development, Fall  
BPS 497/498 (1-6) Special Problems in Pharmaceutical sciences (every spring & fall)  
BPS 460 (1-6) Pharmaceutical Sciences Internship  
BPS 520 (1-3) Biomedical Sciences Journal Club

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**Other URI Colleges**

**Human Disease/Pharmacology**

MIC 333 (3) Immunology and Serology (MIC201) Fall  
MIC 334 (3) Virology (MIC201) Spring  
BIO 341 (3) Principles of Cell Biology (1 sem BIO& Organic)  
BIO 352/BCH 352 (4) General Genetics (BIO101 & 102)  
BCH 435/MIC435 (3) Biology&Genetics of Cancer(BCH311)  
BCH 437/BIO437 (3) Fundamentals of Molecular Biology (BCH311)  
BIO 453/BCH453/MIC453 (3) Cell Biology (BCH311)

**Medicinal/Natural Products/Organic Chemistry**

CHM 427 (3) Intermediate Organic Chemistry (chm228)  
CHM 425 (2) Advanced Organic Laboratory (chm427)  
CHM 521 (3) Adv Organic I; CHM522 (3) Adv Organic II

**Biochemistry**

BCH 464 (3) Biochemistry of Metabolic Disease (BCH311)  
BCH 482 (3) Proteins and Enzymes (BCH311)  
NFS 431 (3) Chemistry of Food & Nutraceuticals (CHM227)

**Regulatory Affairs/Pharmacovigilance/Marketing**

ECN 360 (3) Health Economics (spring)  
BUS 341 (3) Organizational Behavior (pre-BUS minor)  
BUS 342 (3) Human Resources Management (bus minor)  
BUS 365 (3) Marketing Principles  
CSC 492 section 3 (3) Health Informatics (fall)

**Every Specialty**

WRT333 (3) Scientific and Technical Writing  
STA 412 (3) Statistical Methods in Research II  
ITR 302/304 (3) Internship/ Field Study

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These are the **minimum requirements** to transfer from University College into degree-granting college (College of Pharmacy) for the B.S. in Pharmaceutical Sciences degree program. Typical sequence of courses is shown.

**Semester 1, Fall (minimum 15-16 credits)**

CHM 101/102 General Chemistry I lecture and **lab** (3, 1)  
BIO 101/103 General Biology and **lab** (3,1); or PHY 111/185 General Physics lecture/**lab** (3, 1)  
make-up level MTH course (3); or MTH 131 or 141 Calculus (3 or 4)  
URI 101 (1)  
COM 100 (3); or WRT 106 (3); or GenEd A,F,L,S (3)

**Semester 2, Spring (14-18 credits)**

CHM 112 General Chemistry II lecture, CHM114 **lab** (3, 1), pre-req C- or above in CHM101  
BIO 121 Human anatomy with **lab** (4), no pre-requisite, health science majors  
Make up level MTH course (3); or MTH 131 or 141 Calculus (3 or 4); or STA 308 or 409  
COM 100 (3); or WRT 106 (3); or GenEd A,F,L,S (3)  
ECN201 Economics (3) (pre-req MTH111 or higher); or GenEd A,F,L,S (3)

**Semester 3, Fall (13-19 credits)**

CHM 227 Organic chemistry I lecture (3), pre-req C- or above in CHM112  
MIC 201 Microbiology lecture/**lab** (4) (pre-req 1 year of chemistry, 1 semester bio)  
BIO 242 Human physiology (3), pre-req BIO121  
**One, Two or Three of these courses (not taken previously and take remaining during semester 4):**  
ECN 201, Microeconomics (3); or COM 100 (3); or WRT 106 (3); or GenEd A,F,L,S (3)  
MTH 131 or 141 Calculus (3 or 4)  
STA 308 Introductory Statistics (3) (pre-req MTH 107, 111, 131, or 141)  
or STA 409 Statistical Methods in Research I (3) (pre-req MTH 131 or 141)

**Semester 4, Spring (13-19 credits)**

CHM 228, Organic chemistry II lecture (3), pre-req C- or above in CHM227  
BCH 311 Biochemistry (3) (pre-req 1 semester of organic chemistry, 1 semester biology)  
PHY 111/185 General Physics lecture/**lab** (3, 1); or BIO 101 General Biology with **lab** (4)  
**One, Two or Three of these courses (all those not taken previously):**  
ECN 201 Microeconomics (3); COM 100 or 110 (3); WRT 106 (3); GenEd A,F,L,S (3)  
STA 308 Introductory Statistics (3) (pre-req MTH 107, 111, 131, or 141)  
or STA 409 Statistical Methods in Research I (3) (pre-req MTH 131 or 141)  
or STA 307 Biostatistics (3) (pre-req MTH107, 108, 131, or 141)  
BIO 242 Human physiology lecture (3);  
MIC 201 Microbiology lecture/**lab** (4) (pre-req 1 yr of chemistry, 1 semester bio);

**Transfer to College of Pharmacy for BSPS courses.**

**Semester 5-8:**

Many of the early BSPS courses are offered only in the Fall.  
Students must start and stay on schedule to graduate in 4 years. Otherwise 4.5-5 years will be necessary.

**General Education Requirements**

Course		Cr.	Grade
Communications	COM 100 (EC)	3	_____
	WRT 106 (ECw)	3	_____

Currently, WRT 333 Scientific & Technical Writing may substitute  
 Currently, AP test credits for WRT104 may substitute

Mathematics (See Concentration)

**Recommend to take only 3 courses of A,F,L,S during first two years (focus on concentration).**

7 courses total for graduation: 5 courses in A+F+L (2+2+1, any combination) and 2 courses in S.

Fine Arts and Literature (A)	_____	3	_____
Foreign Lang/Culture (F/CC)	_____	3	_____
Letters (L)	_____	3	_____
A, L or F/CC,	_____	3	_____
A, L or F/CC	_____	3	_____
Social Science (S)	ECN 201	3	_____
S	_____	3	_____

Natural Sciences (See Concentration)

URI 101 (semester 1) 1 \_\_\_\_\_

Other courses. Advanced sciences courses might count toward BSPS electives.

Course	CR.	Grade
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**Pre-Pharmaceutical Sciences Concentration**

Course	Cr.	Grade	semester plan
CHM 101 (N)	3	_____	
CHM 102 (lab)	1	_____	
CHM 112	3	_____	
CHM 114 (lab)	1	_____	
CHM 227	3	_____	
CHM 228	3	_____	
*CHM 226 (lab)	2	_____	
BIO 101(N)	3	_____	
BIO 103 (lab)	1	_____	
BIO 121 (lab)	4	_____	
BIO 242	3	_____	
PHY 111	3	_____	
PHY 185 (lab)	1	_____	
MTH 131(MQ) or MTH 141(MQ)	3 4	_____	
**STA 308	3	_____	
MIC 201 (lab)	4	_____	
BCH 311	3	_____	

**For transfer out of UC to Pharm\_BS, student must have passing grade in all concentration courses and ECN201, COM100, and WRT106.**

\* Currently allowing CHM226 to be taken before or just after transfer from UC to COP.

\*\* Currently STA307 or 409 may substitute for STA308.

(Students will typically need 15 credits per semester of the correct courses to complete BSPS pre-reqs in two years.)

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**BSPS Plan of Study, upper level courses in major****Student Name:****Year 3 (BSPS3):**Fall only (12-17 credits)

BPS 301 (2) \_\_\_\_\_

BPS 303 (2) \_\_\_\_\_

BPS 305 (2) \_\_\_\_\_

BPS 311 (2) \_\_\_\_\_

BPS 313 (2) \_\_\_\_\_

BPS 321 (2) \_\_\_\_\_

\*CHM 226 lab (2) \_\_\_\_\_

\*Additional course \_\_\_\_\_

Spring only (10-16 credits)

BPS 325 (2) \_\_\_\_\_

BPS 425 (3) \_\_\_\_\_

BPS 443 lab (2) \_\_\_\_\_

BPS 340 (3) \_\_\_\_\_

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

**\*NOTE:****\*Additional courses include:**

- **BSPS** electives (total 15-16 credits),
- Any remaining general electives (see year 1-2 worksheet),
- Optional courses for minor,
- Any other optional courses.

**Year 4 (BSPS4):**Fall only (10-16 credits)

BPS 442 (3) \_\_\_\_\_

BPS 451 lab (4) \_\_\_\_\_

BPS 503 (3) \_\_\_\_\_

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

Spring only (0-15 credits)

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

\*Additional course \_\_\_\_\_

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**Planned or accomplished BSPS electives**

<u>Course #</u>	<u>course name</u>	<u>credits</u>	<u>semester</u>	<u>Grade</u>	<u>Advisor approval</u>	<u>Academic Affairs approval</u>
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____

**Experiential education (internship or on-campus research) OPTIONAL, but record it here.**

Site \_\_\_\_\_

Paid (yes/no) Dates: \_\_\_\_\_

Academic credit (yes/no, number of credits) \_\_\_\_\_