

# **APPROVED COURSES FOR B.S. BIOLOGY CONCENTRATIONS**

## **CELL AND MOLECULAR BIOLOGY CONCENTRATION (15 credits)\***

### **BIOLOGY**

BIOL 390 **Communicating in the Biological Sciences** (3) Pre: Pre: ENG 100 or 101, BIOL 171/171L, 172/172L [F]  
BIOL 401 **Biotechnology** (3) Pre: BIOL 275. [S]  
BIOL 406 **Cellular Biology** (3) Pre: BIOL 275 and CHEM 273. [S]  
BIOL 406L **Cellular Biology Lab** (2) Pre: BIOL 275L and CHEM 273L. Co-req: 406. [F]  
BIOL 407 **Molecular Biology** (3) Pre: BIOL 275 and CHEM 273. [F]

### **BOTANY**

BOT 410/410L **Plant Anatomy/Lab** (3/1) Pre: BOT 201. Rec: BOT 470. Co-req: 410L. [F]  
BOT 470/470L **Principles of Plant Physiology/Lab** (3/1) Pre: CHEM 152 and BIOL 171. Co-req: 470L. [S]

### **INFORMATION AND COMPUTER SCIENCES**

ICS 475 **Bioinformatics: Introduction** (3) Pre: ICS 311 or consent. [S]

### **MICROBIOLOGY**

MICR 351/351L **Biology of Microorganisms/Lab** (3/2) Pre: BIOL 171 and CHEM 272/272L. Rec: BIOL 275. Co-req: 351L. [F, S]  
MICR 361 **Introductory Bioinformatics** (3) Pre: BIOL 275/275L [F]  
MICR 431 **Microbial Physiology** (3) Pre: MICR 351 and BIOC 441. [S]  
MICR 461 **Immunology** (3) Pre: BIOL 172 or MICR 351. [F]  
MICR 463/463L **Microbiology of Pathogens/Lab** (3/2) Pre: MICR 351 and MICR 461/461L. Co-req: 463L. [S]  
MICR 475 **Bacterial Genetics** (3) Pre: MICR 351. [F]  
MICR 490/490L **Animal Virology/Lab** (3/2) Pre: MICR 351, MICR 461, BIOC 441. Co-req: 490L. [S]

### **PHYSIOLOGY**

PHYL 301/301L **Human Anatomy and Physiology/Lab** (4/1) Pre: CHEM 151 and one of 103, BIOL 171, OR ZOOL 101. [F]  
PHYL 302/302L **Human Anatomy and Physiology/Lab** (4/1) Pre: PHYL 301 or consent. [S]

### **ZOOLOGY**

ZOOL 416 **Histology** (3) Pre: BIOL 275. Rec: BIOL 406. [F]  
ZOOL 420 **Developmental Biology** (3) Pre: BIOL 275. Rec: BIOL 406. [S]  
ZOOL 430/430L **Animal Physiology/Lab** (2/2) Pre: BIOL 275. Co-req: 430L. [S]  
ZOOL 432 **Comparative Physiology** (3) Pre: BIOL 171 and 172, and BIOL 402 or BIOC 441; or consent [S even years]

## **ECOLOGY, EVOLUTION & CONSERVATION BIOLOGY CONCENTRATION (15 credits)\***

### **BIOLOGY**

BIOL 301/301L **Marine Ecology and Evolution/Lab** (3/1) Pre: BIO 265/265L, 275/L and OCN 201. Co-req: 301L and 275/L [S]  
BIOL 331 **Biology of Marine Mammals** (3) Pre: BIOL 171/L, 172/L and 265/L. [F, S]  
BIOL 390 **Communicating in the Biological Sciences** (3) Pre: Pre: ENG 100 or 101, BIOL 171/171L, 172/172L [F]  
BIOL 425 **Wildlife and Plant Conservation** (3) Pre: BIOL 171/171L, 172/172L, 265/265L. [S]

### **BOTANY**

BOT 350 **Resource Management and Conservation in Hawai'i** (3) Pre: college general biology. [F]  
BOT 351 **Inside Tropical Ecosystems/Lab** (3) Pre: BOT 101, or BIOL 171 and BIOL 172. [F]  
BOT 361 **Flowering Plant Families** (4) Pre: BOT 101 or college general biology. [F]  
BOT 430 **Mycology** (2) Pre: BOT 201, BIOL 172. [F alt. years]  
BOT/ZOOL 450 **Natural History of Hawaiian Islands** (3) Pre: one semester of biological sciences at college level. [S]  
BOT 453 **Plant Ecology & Environmental Measurements** (4) Pre: one of BOT 101, BIOL 172, or ZOOL 101. [F]  
BOT 456 **Plant-Animal Interactions** (3) Pre: BOT 201/201L or BIOL 265/265L.  
BOT 462 **Plant Evolution** (3) Pre: BOT 201 or BIOL 172. [alt. years]  
BOT 480 **Algal Diversity & Evolution** (4) Pre: one of BOT 101, BIOL 172, MICR 351, ZOOL 101. [S]

### **MATH**

MATH 304 **Mathematical Modeling I** (4) Pre: MATH 216 or 242 or 252A, or consent. [F]

### **MICROBIOLOGY**

MICR 401/401L **Marine Microbiology/Lab** (3/1) Pre: BIOL 265/L, 275/L, and 301/L, and OCN 201; or MICR 351/L. Co-req: 401L [S]  
MICR 485 **Microbes and Their Environment** (3) Pre: BIOL 172 and CHEM 272. [F]

### **ZOOLOGY**

ZOOL 306 **Ethology** (2) Pre: ZOOL 101/101L. [S]  
ZOOL 439 **Animal Ecology** (3) Pre: BIOL 265. [F]  
ZOOL 439L **Animal Ecology Lab** (2) Pre: BIOL 256, ZOOL 439 [F]  
ZOOL/BOT 450 **Natural History of Hawaiian Islands** (3) Pre: one semester of biological sciences at college level. [S]  
ZOOL 470/470L **Limnology** (2/1) Pre: BIOL 172. Co-req: 470L. [S odd years]  
ZOOL 480 **Animal Evolution** (3) Pre: one of ZOOL 475, 475L, or ZOOL 320; and BIOL 265. Rec: BIOL 275 and 375. [S]  
ZOOL 485 **Biogeography** (3) Pre: BIOL 172. [S, even years]

## **ORGANISMIC BIOLOGY CONCENTRATION (15 credits)\***

### **BIOLOGY**

BIOL 331 **Biology of Marine Mammals** (3) Pre: BIOL 171/L, 172/L and 265/L. [F, S]

BIOL 390 **Communicating in the Biological Sciences** (3) Pre: Pre: ENG 100 or 101, BIOL 171/171L, 172/172L [F]

### **BOTANY**

BOT 410/410L **Plant Anatomy/Lab** (3/1) Pre: BOT 201. Rec: BOT 470. Co-req: 410L. [F]

BOT 430 **Mycology** (2) Pre: BOT 201, BIOL 172. [F alt. years]

BOT 453 **Plant Ecology & Environmental Measurements** (4) Pre: one of BOT 101, BIOL 172, or ZOOL 101. [F]

BOT 470/470L **Principles of Plant Physiology/Lab** (3/1) Pre: CHEM 152 and BIOL 171. Co-req: 470L. [S]

BOT 480 **Algal Diversity and Evolution** (4) Pre: one of BOT 101, BIOL 172, MICR 351, ZOOL 101. [S]

### **MICROBIOLOGY**

MICR 351/351L **Biology of Microorganisms/Lab** (3/2) Pre: BIOL 171 and CHEM 272/272L. Rec: Math 205. Co-req: 351L. [F, S, SS]

MICR 401/401L **Marine Microbiology/Lab** (3/1) Pre: BIOL 265/L, 275/L, and 301/L, and OCN 201; or MICR 351/L. Co-req: 401L [S]

MICR 431 **Microbial Physiology** (3) Pre: MICR 351 and BIOC 441. [S]

MICR 463/463L **Microbiology of Pathogens/Lab** (3/2) Pre: MICR 351 and MICR 461/461L. Co-req: 463L. [S]

### **PHYSIOLOGY**

PHYL 301/301L **Human Anatomy and Physiology/Lab** (4/1) Pre: CHEM 151 and one of PHYL 103, BIOL 171, OR ZOOL 101. [F]

PHYL 302/302L **Human Anatomy and Physiology/Lab** (4/1) Pre: PHYL 301 or consent. [S]

### **ZOOLOGY**

ZOOL 306 **Ethology** (2) Pre: ZOOL 101/101L. [S]

ZOOL 320/320L **Vertebrate Zoology/Lab** (3/2) Pre: BIOL 265. Co-req: 320L. [F]

ZOOL 420 **Developmental Biology** (3) Pre: BIOL 275. Rec: BIOL 406. [S]

ZOOL 430/430L **Animal Physiology/Lab** (2/2) Pre: BIOL 275. Co-req: 430L. [S]

ZOOL 465/465L **General Ichthyology** (3/1) Pre: BIOL 265. Co-req: 465L. [F]

ZOOL 475/475L **Biology of the Invertebrates** (3/2) Pre: BIOL 172 and CHEM 161. Co-req: 475L. [F]

## **MARINE BIOLOGY CONCENTRATION (15 credits)\***

### **BIOLOGY**

BIOL 301/301L **Marine Ecology and Evolution/Lab** (3/1) Pre: BIOL 265/265L, 275/275L, and OCN 201. Co-req: 301L [S]

BIOL 331 **Biology of Marine Mammals** (3) Pre: BIOL 171/L, 172/L and 265/L. [F, S]

BIOL 390 **Communicating in the Biological Sciences** (3) Pre: Pre: ENG 100 or 101, BIOL 171/171L, 172/172L [F]

### **BOTANY**

BOT/ZOOL 450 **Natural History of Hawaiian Islands** (3) Pre: one semester of biological sciences at college level. [S]

BOT 480 **Algal Diversity and Evolution** (4) Pre: one of BOT 101, BIOL 172, MICR 351, ZOOL 101. [S]

### **MICROBIOLOGY**

MICR 401/401L **Marine Microbiology/Lab** (3/1) Pre: BIOL 265/265L, 275/275L, 301/301L and OCN 201; or MICR 351/L. Co-req: 401L [F]

### **OCEANOGRAPHY**

OCN 320 **Aquatic Pollution** (3) Pre: OCN 201 or consent. [F]

OCN 331 **Living Resources of the Sea** (3) Pre: OCN 201. [F]

OCN 450 **Aquaculture Production** (3) Pre: ANSC 200 (or concurrent) and ANSC 201 (or concurrent); and one of CHEM 161, 171, or 272. Rec: OCN 331, ZOOL 430, 439 and 466. [S]

### **ZOOLOGY**

ZOOL 306 **Ethology** (2) Pre: ZOOL 101/101L. [S]

ZOOL 410 **Corals and Coral Reefs** (3) Pre: BIOL 265 [S]

ZOOL 439 **Animal Ecology** (3) Pre: BIOL 265. [F]

ZOOL/BOT 450 **Natural History of Hawaiian Islands** (3) Pre: one semester of biological sciences at college level. [S]

ZOOL 465/465L **General Ichthyology** (3/1) Pre: BIOL 265. Co-req: 465L. [F]

ZOOL 466 **Fishery Science** (3) Pre: One of 410, 465, 470 [S]

ZOOL 467 **Ecology of Fishes** (3) Pre: ZOOL 465 [S]

ZOOL 470/470L **Limnology** (2/1) Pre: BIOL 172. Co-req: 470L. [S odd years]

ZOOL 475/475L **Biology of the Invertebrates/Lab** (3/2) Pre: BIOL 172 and CHEM 161. Co-req: 475L. [F]

## **GENERAL BIOLOGY CONCENTRATION (15 credits)\***

Refer to the APPROVED ELECTIVE COURSES FOR B.A. BIOLOGY MAJORS

\*Only Lab courses that are co-requisites are listed here. Please consult UHM Catalog for all other Lab courses. If you would like to take a 300 or 400 level course that is not listed here, please consult with your advisor.