### PBG 200A — Principles of Population Biology (5 units)
*Course Description:* Principles of single-species ecology and evolution. Topics include ecology of individuals, population growth models, structured populations, life history strategies, stochastic populations, basic population genetics theory, deleterious alleles in natural populations, and molecular population genetics.
*Prerequisite(s):* PBG 231 required concurrently; and consent of instructor.
*Learning Activities:* Lecture 3 hour(s), Discussion 2 hour(s).
*Grade Mode:* Letter.

### PBG 200B — Principles of Population Biology (6 units)
*Course Description:* Principles of multi-species communities. Topics include competition, mutualism, metapopulations, food webs and trophic cascades, interactions between simple ecological communities, island biogeography, succession, and large-scale patterns.
*Prerequisite(s):* PBG 200A; PBG 231.
*Learning Activities:* Lecture 5 hour(s), Discussion 1 hour(s).
*Grade Mode:* Letter.

### PBG 200C — Principles of Population Biology (6 units)
*Course Description:* Principles of microevolution and macroevolution. Topics include evolutionary quantitative genetics, analysis of hybrid zones, speciation, the fossil record, biogeography, and phylogeny reconstruction.
*Prerequisite(s):* PBG 200B.
*Learning Activities:* Lecture 5 hour(s), Discussion 1 hour(s).
*Grade Mode:* Letter.

### PBG 203 — Advanced Evolution (3 units)
*Course Description:* Adaptation and speciation, and biochemical and morphological evolution in plants and animals with emphasis on the appropriateness of different methods of analysis.
*Prerequisite(s):* Graduate standing.
*Learning Activities:* Lecture 1 hour(s), Discussion 2 hour(s).
*Grade Mode:* Letter.
PBG 231 — Mathematical Methods in Population Biology (3 units)

Course Description: Mathematical methods used in population biology. Linear and nonlinear difference equation and differential equation models are studied, using stability analysis and qualitative methods. Partial differential equation models are introduced. Applications to population biology models are stressed.

Prerequisite(s): MAT 016C or MAT 021C, or the equivalent.

Learning Activities: Lecture 3 hour(s).

Cross Listing: ECL 231.

Grade Mode: Letter.

PBG 233 — Computational Methods in Population Biology (3 units)

Course Description: Numerical methods for simulating population dynamics using the computational software package R. Emphasis placed on model formulation and development, theoretical concepts and philosophical principles to guide simulation efforts, model parameterization, and implementing simulations with R.

Prerequisite(s): A course in theoretical ecology (e.g., ECL 231 or an equivalent to ESP 121 from your undergraduate institution) or consent of instructor; no programming experience required.

Learning Activities: Lecture/Lab 2 hour(s), Discussion/Laboratory 1 hour(s).

Cross Listing: ECL 233.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 250A — Interdisciplinary Approaches to Biological Invasions (4 units)

Course Description: An integrative consideration of biological invasions, including an overview of concepts from ecology, ecological theory, evolution, genetics, philosophy, and other areas. Emphasis on potential contributions of each area for interdisciplinary problem-solving.

Prerequisite(s): Graduate standing.

Learning Activities: Lecture/Discussion 4 hour(s).

Grade Mode: Letter.

PBG 250B — Interdisciplinary Approaches to Biological Invasions (4 units)

Course Description: An integrative consideration of biological invasions, including an overview of concepts from history, sociology, communications, law, policy, management, and other areas. Emphasis on potential contributions of each area for interdisciplinary problem-solving.

Prerequisite(s): Graduate standing.

Learning Activities: Lecture/Discussion 4 hour(s).

Grade Mode: Letter.

PBG 251 — Collaborative Project in Biological Invasions (3 units)

Course Description: A year-long interdisciplinary collaborative project focusing on biological invasions, resulting in a paper or other suitable product presented at a symposium at the conclusion of the project.

Prerequisite(s): PBG 250A; PBG 250B; or equivalent courses, and consent of instructor.

Learning Activities: Project, Discussion 1 hour(s).

Repeat Credit: May be repeated 5 time(s).

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 270 — Research Conference in Evolutionary Biology (1 unit)

Course Description: Critical presentation and evaluation of current literature and ongoing research in evolutionary biology.

Prerequisite(s): Consent of instructor.

Learning Activities: Seminar 1 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 271 — Research Conference in Ecology (1 unit)

Course Description: Critical presentation and evaluation of current literature and ongoing research in ecology. Requirements include active participation in weekly discussions and the presentation of a paper or chapter once per quarter.

Prerequisite(s): Consent of instructor.

Learning Activities: Seminar 1 hour(s).

Repeat Credit: May be repeated.

Cross Listing: ECL 271.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 278 — Advanced Animal Behavior (2 units)

Course Description: Reading, reports and discussion on current topics in animal behavior, with a focus on topics that lie at the interface between animal behavior, ecology and evolution.

Prerequisite(s): NPB 102; EVE 100, or the equivalents; graduate standing; consent of instructor.

Learning Activities: Seminar 2 hour(s).

Repeat Credit: May be repeated 2 time(s).

Cross Listing: ANB 287.

Grade Mode: Letter.

PBG 279 — Seminar (1 unit)

Course Description: Seminars presented by visiting lecturers, UC Davis graduate students and faculty.

Prerequisite(s): Consent of instructor; graduate standing.

Learning Activities: Seminar 1 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 280C — Research Conference in Population Biology (1 unit)

Course Description: Presentation and discussion of faculty and graduate student research in population biology.

Prerequisite(s): PBG 299 (can be concurrent); and consent of instructor. Graduate standing; PBG 299 required concurrently.

Learning Activities: Discussion 1 hour(s).

Repeat Credit: May be repeated.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 282 — Topics in Ecology & Evolution (1 unit)

Course Description: Seminar presented by visiting lecturers, UC Davis faculty and graduate students.

Prerequisite(s): Graduate standing.

Learning Activities: Seminar 1 hour(s).

Repeat Credit: May be repeated.

Cross Listing: ECL 296.

Grade Mode: Satisfactory/Unsatisfactory only.
PBG 296 — Seminar in Geographical Ecology (2 units)

Course Description: Recent developments in theoretical and experimental biogeography, historical biogeography and related themes in systematics, the biology of colonizing species, and related topics.

Prerequisite(s): EVE 100 or EVE 101; or consent of instructor.

Learning Activities: Seminar 2 hour(s).

Repeat Credit: May be repeated.

Cross Listing: GEO 214.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 298 — Group Study (1-5 units)

Course Description: Group study.

Prerequisite(s): Consent of instructor; graduate standing.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.

PBG 299 — Research (1-12 units)

Course Description: Research.

Prerequisite(s): Consent of instructor; graduate standing.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.