EVOLUTION OF FISHES (FISH / BIOL 693)
'Syllabus' - Schedule, Format, and Outline

(all material available: http://www.sfos.uaf.edu/ - under 'Academic Course Websites')

note - schedule may change somewhat as this is a new class and enrollment is not yet definite either
- instructor will entertain other topics and suggestions to be covered and/or presented
- is up to student(s) to approach instructor (in time) to discuss and set such alternates up
- assignment deadlines are not flexible and will be as listed below unless instructor indicates otherwise

instructor:
Dr. Gordon Haas.
office: O'Neill 235.
  • email (remote contact preference): haas@sfos.uaf.edu
  - office phone: 474-5231
  - message board on door
  - can also make office appointments after class

class lectures: Tuesdays (2:00 to 5:00 pm)
  • room: Irving II – room 235 (subject to change)

'recommended' or mandatory course book(s):
- no book is mandatory
- mandatory reading list and paper(s) supplied (by me and/or students) for each week’s topic
- resource lists also separately supplied for 'books', 'primary journals', and 'other information'
- latter resource lists are not mandatory, but could be helpful for papers and presentations

class one: (January 21)
  • course introduction, organization, format, and intent
  - assigned literature readings (student suggestions entertained), grading, outline, and schedule
  - instruction on group discussions, literature critique / review, and on oral presentations
  - resource materials for assignments and student assistance
  - discuss alternate or more accommodating schedule and classroom if needed or preferred (?)

classes two to three: (January 28 and February 4)
  • introductory general lectures from instructor
    - lectures expand on some specific assigned readings for students
    - to build sufficient background and heuristic framework for topics and rest of course
    - depending on enrollment, instructor could give more or fewer introductory general lectures
  • general instructor lectures will be followed by class / student discussions and questions
    - to direct and establish a rapport for open and participatory class discussion from all students

class four: (February 11)
  • each class starts with introduction from instructor on general topic area, as necessary or helpful
    - general topic area coordinated with instructor by student giving the specific talk that week
    > followed by an oral presentation given by a student on 1 (to 2) specific literature paper(s)
    - paper distributed by this week’s student speaker at end of last week’s class to all students
      - please coordinate with instructor for photocopying account and use SFOS copier
    - papers to be read by all students for class discussion after this week’s student talk
      - students 'sitting in' on course are requested to also read these papers and participate
  • in only this class four, instructor will also give the detailed presentation on a specific paper
    - done this way to provide an example that demonstrates format and expectations to students
    - in subsequent classes, one student will give the presentation on this specific paper
      - each presentation to be concluded by approximately three 'points for discussion'
        - three 'points of discussion' are to set up subject for class to (initiate) talk about
          - three 'points of discussion' given only in this class four by instructor
        - ~ three 'points of discussion' otherwise to be given by each student at end of talk
        - discussions after student presentations will be further facilitated by instructor
  • instructor / student talks will be followed by critique, discussions, and questions from class / students
    - will eventually direct discussion to research & applications (conservation & management)

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classes five to eight: (February 18 to March 11)
  - each class starts with introduction from instructor on general topic area, as necessary or helpful
    - general topic area coordinated with instructor by student giving the specific talk that week
    > followed by an oral presentation given by a student on 1 (to 2) specific literature paper(s)
    - paper distributed by this week’s student speaker at end of last week’s class to all students
      - please coordinate with instructor for photocopying account and use SFOS photocopier
      - approximately three ‘points of discussion’ to be given by each student at end of talk
      - papers to be read by all students for class discussion after this week’s student talk
  - followed by critique, discussions, and questions from class / students
    - facilitated by instructor as necessary and / or warranted
    - eventually directed to conservation, management, and research applications / perspectives

class nine: - spring break (week of March 17)

classes ten to twelve: (March 25 to April 8)
  - each class starts with introduction from instructor on general topic area, as necessary or helpful
    - general topic area coordinated with instructor by student giving the specific talk that week
    > followed by an oral presentation given by a student on 1 (to 2) specific literature paper(s)
    - paper distributed by this week’s student speaker at end of last week’s class to all students
      - please coordinate with instructor for photocopying account and use SFOS photocopier
      - approximately three ‘points of discussion’ to be given by each student at end of talk
      - papers to be read by all students for class discussion after this week’s student talk
  - followed by critique, discussions, and questions from class / students
    - facilitated by instructor as necessary and / or warranted
    - eventually directed to conservation, management, and research applications / perspectives
  * April 8 is ‘preferred’ deadline for submission of paper written by each student
    - submission now will give me more time for grading and for feedback to you
    - for papers submitted today, I will try to get them graded with comments by next week’s class
  - example exam (see format listed at class 14) distributed today or next week for discussion and review

class thirteen: (April 15)
  - review / summary lecture from instructor
    - ‘exam’ preparation and review (also example exam)
      - class / student discussions and questions
  * absolute deadline for submission of paper written by each student
    - submission now gives me little time for grading and for feedback to you
    - for papers submitted today, I will try to get them graded with comments asap or by exam
      - I cannot guarantee return ‘exam’, but will do my best

class fourteen: (April 22)
  * ‘exam’ (take-home format)
    - format open to some discussion and consideration (but not at last minute)
    - two sets of two questions
      - answer only one question in each set
        - first set of questions will be on a more ‘academic’ issue pertaining to the course material
        - second set of questions will be on an ‘applied’ aspect of the course material
      - questions will require some learned knowledge be synthesized into a reasonable answer
        - ‘difficulty’ of questions will be appropriate to take-home style (still very manageable...)
        - best answers will emphasize brevity, content (quality/completeness), & not length (quantity)
  - exam handed out at start of regular class time (2pm)
    - I will be available for consultation during that regular class time
    - reasonable questions can be brought to me during entire take-home exam period

class fifteen: (April 29)
  - exam returned and answers discussed in class (exams only available if pick them up)

grade submission deadline - UAF registrar: (May 14)
  - I will aim for earlier and will also probably email out grades then for corroboration against transcripts
EVOLUTION OF FISHES (FISH / BIOL 693)
General Topics and Specific Papers

(all material available: http://www.sfos.uaf.edu/ - under ‘Academic Course Websites’)

note - topics may change somewhat as this is a new class and I am open to suggestions for related reasonable papers and subjects from students (is up to student(s) to approach instructor (in time))

class one: (January 21)
- course introduction, organization, format, and intent

class two: (January 28)
- general subject introduction and overview from instructor.
  - no specific readings

class three: (February 4)
- biogeography, evolution, and systematics of northern fishes – further introductory lecture from instructor.
  - (i) subject: fish (aquatic) biogeography and evolution – general overall – northern regions (‘Alaska’)
    - example class reading(s):
      * students should read papers marked **, and if instructor indicates read those marked *
        - other papers listed are for reference and possible interest (or alternates if students request)
  - (ii) subject: fish (aquatic) biogeography and evolution – detailed example – northern regions (‘Alaska’).
    - example class reading and specific primary papers:
      * students read papers marked **, and if instructor also indicates read those marked *
        - other papers listed are for reference and possible interest (or alternates if students request)

class four: (February 11)
- (i) general subject lecture from instructor.
  - subject: fish (aquatic) biogeography and evolution - general example(s) - northern regions
    - example class reading(s):
      * students read papers marked **, and if instructor also indicates read those marked *
        - other papers listed are for reference and possible interest (or alternates if students request)

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**class five to eight, and classes ten to twelve: (weeks of February 17 – April 7)
- introductory general topic lecture from instructor.
- specific literature paper(s) presentation from one student.
  - that student can select from these papers or discuss alternate topics/papers with instructor
    - suggestion from instructor is marked * (reasonably changing this is NOT a problem)
      - presenting student should discuss general subject and specific topic with instructor
        - discussions on topic etc. with instructor should take place in week before talk
          - enables instructor to cover appropriate background material
  * student selects paper(s) & provide copies to students (10) in week previous to presentation
  * other students read paper(s) handed out by student
    - all students also read any general papers instructor may also suggest and distribute
      - other papers listed are for reference and possible interest (or alternates if students request)
    - followed by class critique and discussion.

**class five (February 18)
- topic: species pairs and flocks – general.
  - example class reading and specific primary paper:


**class six (February 25)
- topic: species pairs and flocks – specific examples (freshwater and marine).
  - example class reading and specific primary paper:

**class seven (March 4)
- topic: 'recolonization'.
  - example class reading and specific primary paper:
class eight (March 11)
- topic: salmon (Oncorhynchus) – biogeography.
  - example class reading:

class nine (week of March 17) – spring break (no class)

class ten: (March 25)
- topic: salmon (Oncorhynchus) – evolution and ecology.
  - example class reading:

class eleven: (April 1)
- topic: conservation and management – general application.
  - example class reading:

class twelve: (April 8)
- possible topic (1): conservation / management – specific application (peripheral and isolated populations).
  - example class reading and specific primary paper:
  - today is also is 'preferred' deadline for submission of paper written by each student
- possible topic (2): conservation / management – specific application (climate change).
  - example class reading and specific primary paper:
• today is also is 'preferred' deadline for submission of paper written by each student

class thirteen: (April 15)
- general subject review lecture from instructor.
- class discussion.
  - example class reading(s): - selected pages.
• today is also is absolute deadline for submission of paper written by each student

class fourteen: (April 22)
- exam (take-home)

class fifteen: (April 29)
- exams returned, and answers discussed in class
EVOLUTION OF FISHES (FISH / BIOL 693)
Assignments, Grading, and Evaluations

(all material available: http://www.sfos.uaf.edu/ - under ‘Academic Course Websites’)

Grading (letter grade) – 3 units credit (assigned percentages somewhat open to discussion)
I. class participation = 25 %
II. oral presentation = 25 %
III. written paper = 25 %
IV. exam = 25 %

I. Class Participation: (done in each class)
   - demonstrate understanding of, or interest in, general subjects and specific topics through participation
   - accommodation and consideration for improvements over duration of course will be made
   - subjectiveness of class participation grade will also be accommodated in final course grade

II. Oral Student Presentations: (done as indicated, and at dates, on class schedule)
   - individual detailed critique / examination of one (to two) assigned specific primary literature paper(s)
     - presentation is only on specific primary literature paper(s) (instructor will do general topic intro)
     - received resource materials for presentations and literature/library (see class schedule & handouts)
     - received standardized grading form for presentation (also at http://www.sfos.uaf.edu/)
     - please see instructor if presentation specifications are unclear. Students are responsible for this
     - (priority 1) demonstrate understanding of topic and ability to pass this information on to others, ---
     - ‘success’ of concluding ‘points for discussion’ and subsequent class dialogue also pertinent
     - (priority 2) effective speaking, organization, and appropriate development & use of visual aids
     - visual aids = anything as simple as overheads as long as useful and interpretable
     - (priority 3) further based on clarity, understanding, and appropriate synthesis

III. Written Student Paper: (due by end of class on April 15, and preferably in class for week before (April 8))
   - individual detailed examination of specific primary literature paper(s) and general topic
     - topic and specific primary literature paper(s) are same as for oral presentation
     - should incorporate that week’s instructor’s lecture and class critique / discussion / questions
     - received resource materials for presentations and literature/library (see class schedule & handouts)
     - received standardized grading form for paper (also at http://www.sfos.uaf.edu/)
     - paper must be in ink and at least 1.5 (or 2 = double) line spaced. Handwritten is fine, if legible
     - must both reference scientific literature published in primary journals (see resources handouts)
     - paper must cite references appropriately and consistently (see course handouts)
     - paper must properly use and spell scientific names (see course handouts)
     - please see instructor if paper specifications are still unclear. Students are responsible for this
     - paper will receive a letter grade from instructor with full written evaluation and comments.
     - mainly based on content, understanding, format, ideas, organization, clarity, and readability
     - secondarily on grammar, sentence structure, word choice, spelling, tense, and punctuation

IV. Exam: (week of April 22)
   - take-home examination ‘based’ on all ‘classes’ for entire term (includes student presentations).
     - two sets of two questions, with one written essay-type answer needed from each set
   - two written essay-type answers, each with students able to choose from one of two broad questions.
     - (i) one - general overall ‘academic’ knowledge (interpretation / organization / synthesis).
     - (ii) questions two – ‘application’ to a related specific situation (context).
     - received resources, and will receive example examination and review (see class schedule & website).
     - mainly graded on content, understanding, format, ideas, organization, clarity, and readability.
     - secondarily graded on grammar, sentence structure, word choice, spelling, tense, and punctuation.
     - time constraints of an exam will be accommodated and considered.
     - all answers must be in ink, or no discussion of any grade may take place afterward.
     - will receive a letter grade from instructor.
Actual Grade - ‘Outline’

(UAF policy is also listed at http://www.uaf.edu/catalog/catalog_01-02/undergrad/regs2.html)
- actual letter grades for paper will be broken down into ± categories where appropriate
A (4.0) – great performance (honors grade)
  UAF policy - originality and independent work - thorough subject mastery with more work than regularly required
  GH - exceeds expectations in several areas & meets expectations in all others - insightful & persuasive
B (3.0) – UAF policy - outstanding ability above average level of performance (good performance)
  GH - meets expectations in all areas - convincing and coherent
C (2.0) – UAF policy - satisfactory or average level of performance (adequate performance)
  GH - fails to meet expectations in some major areas - lacks clear argument and comprehension
D (1.0) – minimally acceptable performance (lowest passing grade)
  UAF policy - work of below-average quality and performance
  GH - fails to meet expectations in major & minor areas - particularly poor argument & comprehension

original instructions (handouts and course web page)

primary literature
  appropriate and ‘complete’
scientific names
  correct, used, and proper use (italics or underlined)
  spelling – correct
citations
  > ~ 5 - 10 references
  proper and consistent format
general topic and work (as applicable)
  overall focus or theme
  overall coherence / organization
  format and presentation
  sufficient background information

primary grading (UAF O-W course policy):
  content
  proper format and organization
  understanding
  independent thought (as applicable)
secondary grading (UAF O-W course policy):
  spelling
  grammar
  sentence structure
  punctuation
  word choice / tone
comprehensible review and synthesis:
  clear and concise
  'complete'
  convincing
  'critical' (not just negative)
  interesting
  relevant / 'useful'

logical development and integration in appropriate framework:
  strength and persuasiveness
  appropriate and logical sections and/or format

understanding of general topic:
  recognition, statement, context, and explanation of topic
    why should one care...
  explicit and reasonable
  implications
  background and context
  justification
  relevant information
    synthesis and integration
    relationship of 'parts to whole'
  informed evaluation
    not just a summary (assessment and integration)
  information seeking and assessment skills
  reasoning skills
information gaps and inconsistencies
  general remaining questions and needs
  underlying controversies and validity (if pertinent)
  reasonable speculation / thoughts
  suggestions
    research and study needs
    other applications (if pertinent)

sentence and word structure:
  convoluted and overly complex, or clear / direct
  wordiness
  repetition
  style ('honest' prose, formality, etc.)
Actual Grade - 'Outline'
(UAF policy is also listed at http://www.uaf.edu/catalog/catalog_01-02/undergrad/regs2.html)
- actual letter grades for paper will be broken down into ± categories where appropriate
- late papers will lose a whole letter grade (ie. not just ± categories)
A (4.0) – honor grade (great performance)
   UAF policy - originality and independent work - thorough subject mastery with more work than regularly required
   GH - exceeds expectations in several areas & meets expectations in all others - insightful & persuasive
B (3.0) – UAF policy - outstanding ability above average level of performance (good performance)
   GH - meets expectations in all areas - convincing and coherent
C (2.0) – UAF policy - satisfactory or average level of performance (adequate performance)
   GH - fails to meet expectations in some major areas - lacks clear argument and comprehension
D (1.0) – lowest passing grade (minimally acceptable performance)
   UAF policy - work of below-average quality and performance
   GH - fails to meet expectations in major & minor areas - particularly poor argument & comprehension

Evaluation Criteria
sufficient background
   general class-level understanding
   recognize relevant information
   any implications (within reason)
underlying main assumptions and point(s)
   understood and clearly stated
   independent thought
   critique and evaluation
   suggestions
overall clarity of presentation
   appropriate organized synthesis and framework
   logical development and integration
   clear, concise, direct, and flowing
effective speaking (need not be 'polished')
   evidence of practice and preparation
   appropriate, reasonable, and comprehensible visual aids
   'quality' of visual aids
   transitional visual aids
   'not just reading talk'
   voice / projection
   articulation / vocal variation
   appropriate language level
   irritating distractions / habits (posture / body language / verbal 'patterns')
   eye contact
   persuasive, entertaining and enthusiastic (within reason)
   effective use of time (and on time)
   ability to (attempt to) answer any questions

general topic and work (as applicable)
   focus or theme
   overall coherence / organization
   talk introduction (where appropriate)
   sufficient background information
Course Objectives:

Through critical review and discussion of contemporary literature and selected laboratory exercises:

1) develop an understanding of the concept of scale in ecology
2) develop an understanding of the influence of the scale of assessment on the interpretation of ecological processes and execution of management actions,
3) learn to recognize the scale of an investigation and correctly identify the scope of generality of the work.

Course format is a series of introductory lectures followed by a series of weekly discussions and laboratory sessions. After initial introductory lectures, a number of papers (~2-4) will be assigned for each meeting. Designated students will co-lead a discussion of one of the assigned papers. All students will be required to read each paper and contribute to the discussions. The co-lead student will assume that others have read the papers and will not simply give a book report on the assigned paper. Rather, the leader may, for example, challenge a conclusion or method in the paper, identify hypotheses that may be suggested by the paper and initiate a discussion of how to test those hypotheses, identify some aspect of the paper that they fail to understand and seek clarification, etc. Discussion leaders will be expected to be familiar with important material in the literature cited section of their paper. The instructor will facilitate discussion and provide a summary that synthesizes the literature discussed at the end of each weekly meeting. Students will be evaluated on their performance as discussion leaders and as discussion participants and on their ability to synthesize the course material in response to written essay questions, periodic oral quizzes, and laboratory exercises.

Attendance Policy: Students are expected to attend and participate in all class sessions.

Grading Policy:

1) 20% - Contribution to discussions,
2) 10% - Discussion leadership.
3) 20% - Laboratory Exercises
4) 10% - Quizzes
5) 10% - Midterm exam
6) 30% - Final exam

Miscellaneous: Incompletes will be granted only in exceptional circumstances (e.g. death).
Preliminary Topic Outline:

Definitions:
- Levels/Orders of processes
- Hierarchies
- Scale
  - Fuzzy terms and relativity
    - Macro, meso, micro
    - Landscapes, regions, areas
- Scope
  - Grain/resolution
  - Extent
- Domains and extrapolation
- Scale dependency
- Borders
- Decisions and scale
  - Frequency
  - Constraints
  - Importance

Study Design
- What determines relevant scale?
- Single scale
- Multiple Scale
- Detecting scale
- Generality of results

Sampling Units
- Congruity
  - Spatial
  - Temporal

Process/management, some case studies
- Physiological processes
- Allometric relationships
- Habitat selection
  - Top down/bottom up implications
- Population dynamics
- Density dependence
- Species interactions
  - Predation
  - Competition
- Biodiversity
- Fragmentation
- Metapopulations
  - “Cumulative” effects
- Landuse
  - Local actions
  - “Regional” effects

Directions

Examples of selected readings:


