CORAL REEF ECOLOGY LECTURES  
SYLLABUS -- EBIO 4090  
FALL SEMESTER 2017: DECEMBER 30, 2017 to JANUARY 5, 2018

Four-hour, image-illustrated, lecture-format classes will meet starting at the above date from 8:30 am - 12:30 pm in Ramaley N1B23, except Day 6 which will go until 1pm. If the building is locked for the weekend, enter by the east-central door near Mel’s office. The lectures will be interrupted by several short breaks, and coffee, tea and light breakfast foods will be provided. The first three and one-half hours will cover the academic subject matter, and the last 30 minutes will cover SCUBA diving techniques and safety concerning the field portion of the course. It is expected that the afternoons will be used for studying and/or preliminary library research concerning the required paper due in January (see Library Research Paper Guidelines, following).

<table>
<thead>
<tr>
<th>DATE</th>
<th>LECTURE TOPICS</th>
<th>CHAPTERS</th>
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<tbody>
<tr>
<td>Day 1</td>
<td>Introduction: Library research paper guidelines and topic sign up. Coral reefs: diversity; productivity; distribution; evolution. Cnidarians: Hydrozoans (hydroids, fire corals, siphonophores); Scyphozoans (jellyfishes); Cubozoans (sea wasps or box jellyfish) and Anthozoans (sea anemones and hard corals). Diving: What to expect in Cozumel – diving &amp; otherwise.</td>
<td>1 - 6</td>
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<tr>
<td>Sat -12/30</td>
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<td>Day 2</td>
<td>Soft corals plus reproduction, zooxanthellae, bleaching, paleoclimatology; Biological Classification; Protists (phytoplankton &amp; zooplankton); Plants; Sponges; Comb jellies; Flatworms; Molluscs: bivalves. Diving: slow ascents, buoyancy control and reducing air consumption. Dive logs vs. Field logs.</td>
<td>4</td>
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<tr>
<td>Sun -12/31</td>
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<td>JAN 1</td>
<td>No Class (Mon-1/1) NEW YEARS DAY -- NO CLASS</td>
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<tr>
<td>Day 3</td>
<td>Gastropods w/ nudibranchs; Cephalopod introduction; Nautiluses; Cuttlefishes and Squids. Diving: underwater navigation/stress reduction.</td>
<td>4, 7, 9</td>
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<tr>
<td>Tue -1/2</td>
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<td>Day 4</td>
<td>Octopuses; Annelids (polychaetes); Arthropods/Crustacea (lobsters; shrimps; crabs; misc.). Diving: night diving; reducing anxiety and air consumption.</td>
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<td>Wed -1/3</td>
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<td>Day 5</td>
<td>Bryozoans; Echinoderms (all classes); Chordates (tunicates; sharks; rays; bony fish). Fishes: General differences (day/night, juvenile/adult, male/female, camouflage, eye deception, color adaptations); Morays; other eels; Schooling behavior. Cleaning symbioses. Misc. symbioses. Loss of color at depth. Diving: deep diving/nitrogen narcosis; boat protocols.</td>
<td>11 - 14</td>
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<td>Thu -1/4</td>
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<td>Day 6</td>
<td>Note: This day ends at 1 pm. Videos/DVDs: “Reef Fish ID: FL/Caribbean” (60); “Caribbean Fish Book” (45); “Blue Planet/Coral Seas” (48); Common Caribbean Fish species. Final arrangements: DIA transport. Course final exam (last hour).</td>
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<td>Fri -1/5</td>
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<td>Day 7</td>
<td>Travel to Cozumel -- Begin Field Studies</td>
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<tr>
<td>Sat -1/6</td>
<td>Afternoon Resort Orientation at El Cid/La Ceiba: <a href="http://www.elcid.com/ceiba_beach">http://www.elcid.com/ceiba_beach</a></td>
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Library Research Paper Due Thur., 3:00 pm, Feb. 1st. Late papers = minus 10% for one wk; then = zero. Note: Course credit cannot be used for a Dec/2016 graduation since the term paper is not due until Feb/2017!
SYLLABUS (continued)

TEXT: *A Field Guide to Coral Reefs of the Caribbean and Florida* by Eugene H. Kaplan. 1999. Houghton Mifflin Co., Boston. Note: The 1982 edition is also okay. This guide is dated, but it still has some useful general marine ecology which will be helpful, and it is useful as a general Caribbean I.D. book. Since it is “out of print” it may not be available locally; try dive shops and *Amazon.com*. Recommended reading assignments are on the previous page.


FINAL EXAM: This short-answer, short-discussion exam counting 30% of the course grade will come primarily from the lecture materials (available on D2L) and will be given at 12:00 noon on the last day of lectures. Information in the text will undoubtedly support and supplement the lectures.

LIBRARY RESEARCH PAPER: A six-to-ten page, liberally-cited paper, using a minimum of six scientific, refereed journal articles on some aspect of Coral Reef Ecology, will count 60% of the course grade. While a few popular press sources may be added to the above references, the bulk of the resource material must come from the aforementioned scientific literature.

Interlibrary loan requests should be made early so that the papers will be available upon returning from the Caribbean. During the Christmas break, Norlin and Benson Libraries will be operating on restricted hours, so afternoons must be used efficiently. Attached is a non-exhaustive list of “Possible Project Topics.”

The paper topic needs the instructor's prior approval, must be word processed (double-spaced) and submitted, along with a digital copy compatible with Microsoft Word 2000, no later than 3:00 pm, Thursday, February 1st, 2018. Late papers will be accepted for a 10% penalty until 3pm the following Thursday. Note: This Feb/2018 course assignment prevents credit being used for a Dec/2017 graduation.

Refer to the following attached information on the “Library Research Paper Guidelines.”

FIELD JOURNAL: While in the Caribbean, students must keep a Field Journal. This journal will count 10% of the course grade and is due to be turned in by the first day of class following the return to Boulder. There is a 10% penalty for being late, up to one week – after that, no credit. Document this information by hand either on the backs of diving-log-book pages or a bound, standard log or record book and make your entries by hand, in ink, and include the time, date, location, weather/sea conditions, and the organisms you encounter and any interactions among them you observe.

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ATTACHED:  
Library Research Paper Guidelines
CORAL REEF ECOLOGY - LIBRARY RESEARCH PAPER GUIDELINES

I. LIBRARY RESEARCH PAPER FORMAT

TOPIC/PURPOSE/FORMAT: This assignment is designed to follow the independent library research one might do for background information on his or her own research project. The paper may be either persuasive or argumentative in nature – not descriptive (i.e., not like a high school book report). A coral reef ecology topic should be chosen which has not been previously selected, and it should be entered on the appropriate class “sign-up sheet.” It must be approved by the instructor. The scientific literature on this topic is to be researched and reported on in a manner understandable to a non-expert in the field. Do not submit an abstract of the paper.

LENGTH: Six-ten, typed, double-spaced pages using a minimum of six scientific, peer-reviewed journal articles as references. “Times New Roman” w/ # 12 font is preferred.

DUE DATES/LATE POLICY: The paper is due at 3:00 pm, Thursday, February 1st, 2018. This deadline is firm. The library research paper is to be started early to avoid last-minute, unforeseen problems. For a 10% penalty, the paper will be accepted late until 3pm the following Thursday. This penalty will be deducted from the final paper score (see PAPER EVALUATION, below). The hard copy needs to be in a format that is compatible with Microsoft Word 2000. The “Library Research Paper” can be turned in during office hours or placed under the door of RAMY C170. In addition to a hard/printed copy of the paper it is also required that a digital copy be submitted at the same time, either on a disc or via email. This digital copy will be submitted to the large data base of TurnItIn.com which, by the way, students may choose to use.

PAPER EVALUATION (Refer to Parts II, III, IV and V following):
A. 70% PAPER CONTENT including: organization; strength and support of the argument/thesis; clarity; grammar; overall writing style; in-text citations. Do not use inappropriate “second-hand references” -- i.e., references that others have used, but which you haven’t read firsthand, but have included in your Literature Cited.

B. 15% BACKGROUND RESEARCH. This refers to the nature of the scientific references: Are they mostly peer-reviewed scientific journals? Is there a minimum of six?

C. 15% LITERATURE CITED SECTION. Does it follow the proper format? Is it complete and accurate? Are there inappropriate references; i.e., ones not cited in the text of the paper? Are there in-text citations with no references here? Is there a lack of ambiguity between in-text citations and the references?
II. RESEARCH METHODS/REFERENCES: Since this is a scientific paper, the bulk of the resource materials must come from the scientific literature. Following are Norlin Library Resources which are available for helping you with your topic search:

Chinook http://www-libraries.colorado.edu is CU Boulder’s on-line catalog and e-Resources access.

Off-Campus Access VPN http://ucblibraries.colorado.edu/research/offcampusaccess.htm Best to use the Network Connect rather than the Web VPN. This is done through Office of Information Technology (OIT) and if you need help you can call 303-735-HELP

To retrieve journal citations (and in some cases full-text articles) click on Find Articles & More http://libraries.colorado.edu/screens/findarticles.html From there you can type in the database name, use the A-Z list, or select Find Database by Subject.

General All Subjects Databases:

- Academic Search Premier http://libraries.colorado.edu/record=e1000006~S3 all subjects, full text. So it’s sort of like Google but Full Text!!
- Google Scholar http://libraries.colorado.edu/record=e1000945~S3 all subjects, NOT all Full-text

Databases of Interest to Tropical Marine Ecology students:

- Biological Abstracts (BIOSIS) http://libraries.colorado.edu/record=e1001381~S3 All aspects of biology
- Animal Behavior Abstracts http://libraries.colorado.edu/record=e1000161~S3
- Ecology Abstracts http://libraries.colorado.edu/record=e1000226~S3
- GeoRef http://libraries.colorado.edu/record=e1000242~S3 Geology, geography, and oceanography
- Web of Science http://libraries.colorado.edu/record=e1000285~S3 Science Citation Index which covers all aspects of science, but only the top tier research journals

FULL-TEXT DATABASES:

- Science Direct http://libraries.colorado.edu/record=e1000063~S3 Database searching over 1200 journals in science and social science. Access for many (800-900 approx.) of the titles held by CU is 1997 and forward.
Ø JSTOR http://libraries.colorado.edu/record=e1000019~S3
Geography, sociology and ecology, archive of full-text backfiles of important scholarly journals includes:
• Annual Review of Ecology and Systematics
• Ecological Monographs
• Ecology
• Journal of Ecology
Ø ENVIROnetBase http://libraries.colorado.edu/record=e1000237~S3
Full text environmental reference books.

Other Resources for Research

Government Publications Library — Norlin Library 3rd Floor
http://ucblibraries.colorado.edu/govpubs/index.htm

Interlibrary Loan: from Chinook homepage under Interlibrary Loan.
Ø http://ucblibraries.colorado.edu/ill/index.htm
Illiad – traditional borrowing from other institutions, 2 weeks or less delivery of copies (paper or electronic) of articles, dissertations, books, etc. are sent at no cost.
Ø Prospector – borrowing from Front Range Libraries, usually 3-5 days.
Ø PASCAL — http://ucblibraries.colorado.edu/about/pascal_request.htm
(CU’s Offsite Storage Facility in Denver), Science journal articles pre-1980 are available on a 24 hr turn around, scanned copies under 50 pages.

What must be cited? http://ucblibraries.colorado.edu/how/citationstyle.htm
This is a web link to a Libraries page which gives general guide lines for when to cite.

RefWorks http://ucblibraries.colorado.edu/how/refworks.htm
A tool that allows users to create personalized databases of citations from which you can create bibliographies and format papers in hundreds of different citation styles in seconds. From CHINOOK homepage select at the top of the page How Do I…. http://ucblibraries.colorado.edu/how/index.htm then click on the far right column for RefWorks. Set up your own user name and password. There are tutorials as well.

It is acceptable to use a few “popular press” and/or internet references in addition to the peer-reviewed, scientific ones. However, using fewer than the minimum number of scientific references (six) will result in a significant reduction in paper score. Following the guidelines listed herein will eliminate these penalties and emphasize the importance of the “scientific” nature of this paper. Articles from such publications as American Scientist, Science News, National Geographic, National Wildlife, Natural History, Wildlife Conservation, New Scientist, Discover, Sea Frontiers, Audubon, Ocean Realm, Underwater USA and textbooks or books in general are “popular press” publications (not peer-reviewed, scientific publications) and not to be the primary references in this paper. This also applies to articles downloaded from the internet.
CITATIONS/IN-TEXT: Both the author(s) and the date must be used for a citation, and it must not be ambiguous. For example: a) “Smith and Jones in 1992 found that...” or b) “The reproductive behavior and physiology in sharks was discovered to be quite complex (Smith and Jones, 1992).” Use a semicolon to separate two or more in-text citations (e.g., Smith and Jones, 1992; Jones, et al., 1994a). Footnotes must not be used. The above, and following, examples are taken from the “Sample Format,” see Section IV, below.

In citing a book, it is necessary to include the page number from which the citation was taken, e.g., (Jones, 1973, p. 421). Note: This page citation is not to be included with the reference in the “Literature Cited” section (see Jones, 1973). The page number is not to be included when citing a journal article; e.g., “Hansen, et al., 1992” would be sufficient. The use of “et al.” is to be used whenever three or more authors are involved.

PLAGIARISM: Researchers must be given credit (via citations) in the paper for the work they have done. Failure to do so is a form of plagiarism. Highest standards are expected for all work, and academic honesty is a part of this expectation from the students in the College of Arts and Sciences and from the students in this course. Refer to the Academic Integrity Policy and the CU-Boulder’s Honor Code (http://www.colorado.edu/policies/academic-integrity-policy). Students should be aware that their papers will be evaluated through TurnItIn.com, a plagiarism service provided to the faculty members at UCB, and that this service retains a copy of the submitted paper for future comparisons.

III. LITERATURE CITED SECTION NOTES:

A “LITERATURE CITED” section is to be added at the end of the paper, and it is to include all references used in the text of the paper and no others. The format below (Section IV) must be strictly followed! The heading of this section should be “Literature Cited”; not something else like “References,” etc.!

The journal articles/references are to be alphabetically ordered by the last name of the first author. Only the first author of a paper will be last name first!

Last names and initials of all authors must be used. “Et al.” may not be used here.

If there are multiple papers by a single author (or a team of authors), the most recent paper must be listed first.

If a single author is also the first author on a multiple-author publication, list the single-author reference first, regardless of the publication dates. Duo-authored papers follow single-authored papers and appear before multiple-authored papers.
Ambiguity must be eliminated when multiple papers by a single author (or a team of authors with the same first author) are published in the same year. Adding an “a,” “b,” etc., to the year as a suffix (e.g., 1993a) will eliminate this ambiguity. The same suffix in the In-Text citation is to be used. See “Jones, 1993 (a & b)” and “Jones et al., 1994 (a & b)” below in Section IV.

If multiple-authored papers with the same first author are published in different years, put the most recent one first, regardless of the alphabetical listings of the secondary authors (“multiple authors,” here is interpreted as three or more). See “Jones et al., 1995,” “Jones et al., 1994a” and “Jones et al., 1994b” below.

The authors’ names will be followed by the year of publication.

The title of the paper follows the year, and that is followed by a period (.) and then the name of the journal or publisher. The name of the journal or publication must be either italicized or underlined (see examples below in Section IV).

The name of the journal is immediately followed by the volume number, a colon with no space and the page numbers of the article. Some publications include an issue number in parentheses, e.g., “(4),” or with an abbreviation, “No. 4,” after the volume number. This issue number is NOT to be included here.

If a book is used, the sample format below must be followed -- see “Jones, 1973,” or “Miller, 1991.” A book is a non-refereed publication and, if used, must be in addition to the minimum of six scientific references.

If a reference is taken from the internet, it is not refereed and is considered to be a popular press publication. It may be used, but only in addition to the minimum of six scientific references. Include the date it was accessed. Be thorough, but you may need to be creative in listing an internet source in the “Literature Cited” section and as an “in text” citation. For instance you might use “NOAA, 2013” as the “in text” citation for the following internet publication: “US Department of Commerce: National Oceanic and Atmospheric Administration. 2013. NOAA's Coral Reef Conservation Program. <http://coralreef.noaa.gov>” and alter this as shown in the sample format below.

If a reference is not cited in the text of the paper, it is inappropriate for it to be included in the “Literature Cited.”
IV. LITERATURE CITED SECTION SAMPLE FORMAT:


V. HELPFUL HINTS:

Since this is a take-home assignment counting twice as much as the final exam, it seems that starting early, following all the guidelines and submitting an “A” paper would be in one’s best interest.

The scientific literature is often difficult to understand. It should be read and re-read until its significance can be logically explained to someone else.

The paper topic should be thoroughly researched and a level of understanding reached such that the results and assumptions of the researcher can be questioned. One should be willing to challenge the researcher’s conclusions.

Look for alternate premises and differing points of view. A scientific versus a less authoritative view might be argued. Additional popular press references may be helpful here. It is necessary to distinguish between facts and opinions. What one writes should reflect what he or she judges to be most logical and credible. Evidence from both sides of the argument should be included. Take a side, and use persuasion, logic and organization to defend it.

The thesis of this paper should be thoroughly defended and obviously reflect its author’s own thoughts and ideas. Be reminded that this is not original research -- but a properly cited report on the research of others.

A significant amount of time should be spent on the organization of this paper. Pay particular attention to what is best for the audience. The audience should immediately realize where the paper is headed. Appropriate headings and transitions as well as attractive graphics will help hold the interest of the audience.

Only information (statements, figures, tables, photos, graphics, etc.) which is necessary for the support of the position/thesis should be integrated into the paper. Superfluous information (such as superfluous references in the “Literature Cited”) is both inappropriate and confusing.

Be reminded that scientific names and foreign words such as “et al.,” “via,” “i.e.,” ”in situ,” or “El Nino” wherever they are used are to be either italicized or underlined. The “species” name is never capitalized and the “Genus” name is always capitalized. See correct usage in several examples of the previous “LITERATURE CITED SECTION SAMPLE FORMAT” (Section IV).
This paper is to be carefully organized, clearly and concisely written with correct grammar, and be free of typographical errors. It should evolve through several revisions and be proofread by both the author and one or more outsiders. Submit a clean, neat, originally printed paper including a “Title Page” with all of the pages numbered. On the title page include the paper title, author, date and the course name and number. A few ink corrections are acceptable. In addition to a hard/printed copy of the paper, it is also required that an electronic copy be submitted, either on a disc or via email. This copy needs to be in a format which is compatible with Microsoft Word 2000.

NOTE: MAKE SURE THIS SYLLABUS IS UP TO DATE!

30/Mar/17