SOLUTIONS MANUAL

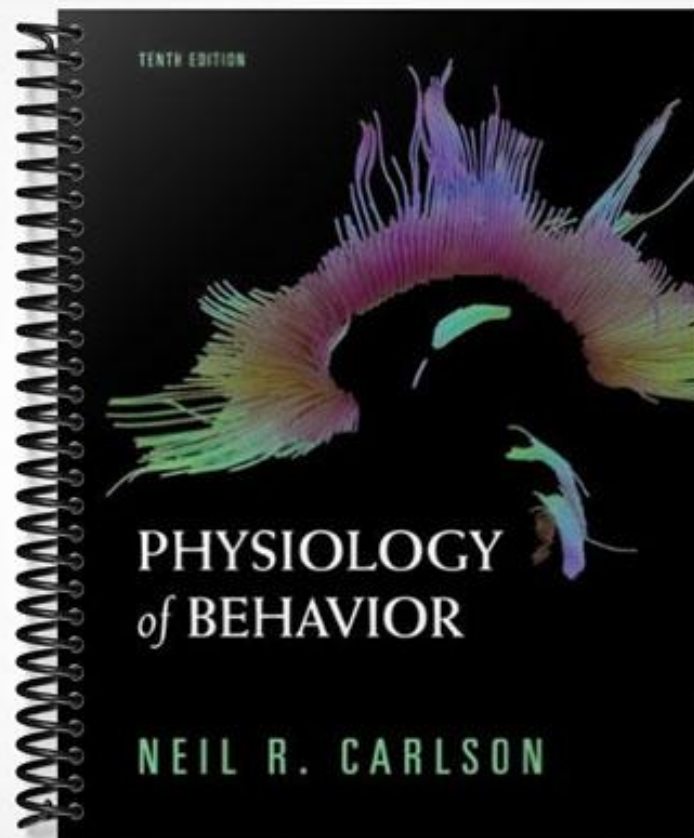TENTH EDITION

PHYSIOLOGY
of BEHAVIOR

NEIL R. CARLSON

Instructor's Manual

for

Carlson

Physiology of Behavior

Tenth Edition

prepared by

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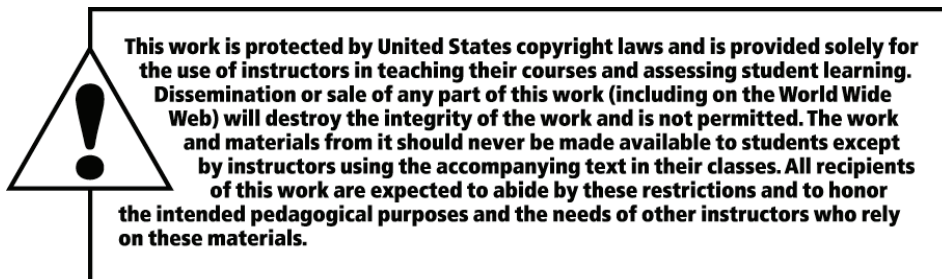The State University of New York

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Preface
Teaching the Physiological Psychology Course

GENERAL COMMENTS ABOUT THIS INSTRUCTOR'S MANUAL

Physiological psychology is the branch of neuroscience concerned with the physiological mechanisms that govern behavior. It is an area that interfaces between psychology's concern with understanding the behavior of humans and animals and those areas of neuroscience related to understanding the brain. Your goal in this course is to introduce students to the physiological bases of behavior. At the start of the course, you will provide your students with an elementary background in neurons and neurophysiology, neuroanatomy, neurochemistry, and the methods used in physiological research. These are the core concepts by which we understand, approach, and explain the content areas of physiological psychology. After grasping these concepts, students can begin to understand how the nervous system processes sensory input (visual, auditory, and tactile) as well as how muscle systems control movement. Similarly, these core concepts allow students to begin to understand how discrete nervous system mechanisms can contribute to the control of behaviors as diverse as feeding and drinking, sexual behavior, addictions, memory, and thought.

COURSE DESIGN

While this section may be most useful to new faculty, even faculty who have taught this course several times may find that they can benefit from rethinking their course approach.

I am assuming that you have looked at various texts for the course and have selected the Carlson text because you felt that it was appropriate for your department's objectives, your student's abilities, and your personal objectives for the course.

Before you begin creating assignments and a syllabus for the course, think about why your students are taking the course, what their personal and professional goals are, and what content is essential for their successful completion of the course as well as preparing them for future courses, their careers, or their lives. Your goal should be to help the students in your course at your institution learn as much as they can in your course. Be careful not to assume certain types of preparation unless you have considerable control over who takes the course and their success in courses prior to the one that you are teaching. Discuss student preparation and ability with other faculty. If they express frustration with certain abilities in the students, such as problems with writing APA style papers, or lack of preparation for class by reading the chapters, design your course to support or encourage appropriate course behaviors that are seen as common problems and that you see as essential to the student's success.

What you assign and what you present in the classroom should depend on the preparation and level of student you are working with. Even students with a high level of ability may lack preparation in some foundation areas. You may select not to cover the entire text if the students will require extensive assistance with foundation concepts. Students who are less prepared will require more extensive support materials and assistance outside of the classroom to be successful.

Whether or not you include a laboratory component in your course is a more complicated issue. The number of formal physiological psychology laboratory courses has declined over the years for a variety of reasons. Decreases in funding have led to cutbacks in undergraduate courses. The physiological psychology laboratory is an expensive enterprise. In addition to cost, there is the issue of the use of animals in undergraduate laboratories. In many instances, physiological laboratories involve surgical and experimental procedures using rats as subjects for the laboratories. Over the years, animal care guidelines have become more stringent and have driven costs upward for the use of animals in undergraduate laboratories. A related factor has been resistance to using animals in undergraduate laboratories, in part because of pressure exerted by animal rights activists who deem behavioral research

to be without value. The combined effect of these factors has been to reduce the number of animal laboratory components associated with the physiological psychology course.

Yet, it is possible to institute a laboratory component using a minimum number of animals or with only the animals at your disposal, the human beings enrolled in the course.

Part of the intent of this manual is to provide you with ideas for inclusion in a formal laboratory or ideas that you can use as demonstrations in your course. Examples of these are to use sheep brains for dissection for neuroanatomy, physiological recording in human beings and microcomputer exercises designed to illustrate neurophysiology, neurochemistry, and sensory/motor processes in the brain. In the last few years, software developers have placed products on the market that provide simulations of key physiological processes, such as membrane potentials and action potentials. Examples of these products are found in the section III of this manual. Another approach is to take advantage of the Internet sites devoted to biopsychology topics. You may wish to use Internet research exercises as a part of your course.

As you begin to plan the course, you must deal with these issues.

Gather the Resources that you have at your Disposal.
- The text book
- The CD with materials from the text
- The free videos from the publisher
- The test item bank
- This instructor's manual
- Library resources in your institution or community
- A list of videos available in your institutional and local library (community libraries often have some of the best educational videos available)
- Books from your own library or the institution library that could be placed on reserve
- A list of relevant software available on your campus
- A list of models, preserved brains, equipment available in your department or accessible from another department on campus
- Laboratory Equipment and space available
- Information on resources available to students
- A course management system on your campus for online materials
- Web sites with appropriate materials
- Tutorial Assistance: Writing Laboratories, Teaching Assistants, Peer tutors
- Support materials for under-prepared students
- Access to other students outside of class

Objectives
Begin a list of overall objectives. They might include goals such as the following examples.

At the end of this course, the student should:
- Be able to locate brain structures on a diagram and describe their functions.
- Be able to describe the methods used to collect information about the nervous system.

The rest of the objectives indicate the specific content that the student should have acquired in the course. These objectives require that the student remember some of the course content, but that he or she is also prepared to use this information in some way. These higher-level objectives are appropriate for an upper level course.
- Be able to use the vocabulary of psychology and neuroscience in describing brain functioning and behavior.
- Be able to read a medical report or case study with minor assistance from a dictionary.
- Be able to identify the location of a lesion from a MRI, PET scan, or Diagram.
- Be able to describe the potential outcome of damage to nervous system structures.

- Be able to write a summary of the research on a particular type of nervous system damage and draw conclusions as to the most valid interpretation of the data available.

A good place to begin when outlining the objectives for a course is a report that came out of a conference examining goals and objectives for undergraduate psychology majors.[1] This document is available from the Office of Teaching Resources for Psychology. It includes goals in the following areas:

- Goal 1. Theory and Content of Psychology
- Goal 2. Methodology
- Goal 3. Application of Psychology
- Goal 4. Information Competence, Technology, and Computers
- Goal 5. Critical Thinking, Logic, and Problem-Solving
- Goal 6. Cultural Awareness
- Goal 7. Communication Skills
- Goal 8. Personal Development

For specific recommendations of content objectives, I often begin with the standards for high school psychology. I use this as the basis to develop more advanced objectives for my course as the content is often the same, but the level of student understanding should be higher in a college level course. These are available on the APA web site.[2]

For example, here are some of the standards for biology in the Standard Area: Biological Bases of Behavior

Content Standards

After concluding this unit, students understand:

1. Structure and function of the neuron
2. Organization of the nervous system
3. Hierarchical organization of the structure and function of the brain
4. Technologies and clinical methods for studying the brain
5. Specialized functions of the brain's hemispheres
6. Structure and function of the endocrine system
7. How heredity interacts with the environment to influence behavior
8. How psychological mechanisms are influenced by evolution

Content Standards with Performance Standards and Suggested Performance Indicators

Content Standard 1: Structure and Function of the Neuron

Students are able to (performance standards):

1.1 Identify the neuron as the basis for neural communication.

Students may indicate this by (performance indicators):

- Using diagrams, models, and/or computer programs to identify the structure and function of different parts of a neuron
- Discussing how internal and external stimuli initiate the communication process in the neuron

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1 Allen, M.J., Noel, R., Deegan, J., Halpern, D., & Crawford, C. (2000). Goals and objectives for the undergraduate psychology major: Recommendations from a meeting of California State University psychology faculty
http://www.lemoyne.edu/OTRP/otrpresources/otrp_outcomes.html

2 National Standards for the Teaching of High School Psychology, APA
http://www.apa.org/ed/hscontents.html

- Describing the electrochemical process that propagates the neural impulse

1.2 Describe how information is transmitted and integrated in the nervous system.

Students may indicate this by (performance indicators):

- Describing the process of synaptic transmission
- Contrasting excitatory and inhibitory transmission

1.3 Analyze how the process of neurotransmission can be modified by heredity and environment.

Students may indicate this by (performance indicators):

- Comparing the effects of certain drugs or toxins with the effects of neurotransmitters in relation to synaptic transmission
- Discussing the role of neurotransmitters in Parkinson's disease, hyperactivity, and/or multiple sclerosis

Levels of Cognitive Complexity

Objectives define the content of the course and the level of understanding and performance that you wish to see in your students. Bloom's Taxonomy (Bloom, 1956) has been used for many years to describe the level of cognitive complexity of information and is a good way to begin to think about the difficulty of the objectives in your course. Others, such as Dee Fink (2003), have extended this list to include other characteristics of the learning process such as Valuing, Learning how to Learn, and the Human Dimension.

Often, introductory courses concentrate more on the lower level objectives, expecting that the students remember course content and can reproduce it on an exam. While this is necessary if one is to be able to use the information, it is not appropriate for college level courses at the upper level to require only memorization of facts. What are often referred to as critical thinking or problem solving skills are an important part of the college experience.

While it is possible to organize most objectives into this hierarchy, an assignment or objective may test content at many levels. The criteria that you set for adequate responses will determine the real level of the objective.

Here is a brief example with some relatively simple content.

You wish the students in the class to be familiar with assumptions about the relation between behavior and functional locations in the cortex of the brain.
- A **knowledge** objective might prompt a question asking the student to label the lobes of the cortex on a diagram of the brain and indicate common functions associated with these areas.
- A **comprehension** objective might also require that the students draw lines indicating the limits of the areas or work with a diagram in a different orientation than used in class or the text.
- An **application** objective might provide a diagram with a location described in a "pseudo" medical report and ask the student to indicate the location on the diagram
- An **analysis** objective might provide X-rays or MRI or PET scans that represent obvious abnormalities and ask the students write a brief paragraph that identifies the location of visible characteristics.
- A **synthesis** objective could require that students integrate other information with their knowledge of the cortex such as locating an area on a diagram that might be related to a particular behavioral outcome and suggest possible problems that the individual might have.
- An **evaluation** objective might include asking students to discuss the limitations of assigning a particular function to a cortical area.

- A **valuing** objective might encourage the students to describe the importance of this knowledge to them, how interested are they or how do they feel about studying the nervous system.
- A **learning how to learn** objective might look for the student's ability to apply study skills to learn new terminology.
- A **human dimension** objective might ask the students to reflect on their knowledge of the functioning of the nervous system and how they experience it personally, such as describing how they felt when in a frightening situation and relating this to ANS arousal.

Assessment & Evaluation

How Do You Know That Students Are Meeting the Objectives for This Course?

You don't have to wait for the final exam.

Assessment allows you to see how things are going as the class progresses and to make necessary changes. Ask students to self assess throughout the semester.

- Ask them to turn in a note card or sheet of paper rating their current understanding from one to five with one - being no understanding and five - being near perfect competence.
- Ask students for one thing from the day's class or section of the course that was new or interesting to them and one thing that is still fuzzy or not understood.
- Provide a short quiz online before class or at the beginning of each class that addressed the content of any reading assigned. You do not have to give credit for these quizzes, but even if they are only worth 5 or 10% of the grade, students will take them more seriously. Be sure you provide the correct answers as soon as possible so that students can correct their errors.

How can you Evaluate the Quality of the Student's Work?

Be sure that students have the opportunity to learn the materials before they are subject to evaluation.

Make sure that the students know the detail in which you wish them to know the material. Are you concerned with the fine details of structure and function or are you more concerned with the general application of the concepts learned. If you are concerned with facts, multiple-choice questions that are well written can provide good information about student achievement. If you are concerned with exam application ability or critical thinking skills, you may wish to have more of the final grade dependent on essay exams, assignments, and projects.

Now that you have some idea of what you want the student to learn, you can begin to structure the course to promote and support this type of learning.

Student Preparation

There is a variety of means to check prerequisites. One approach is to place the prerequisites in all material relating to your course (the announcement, the syllabus, the college or university catalog, and the semester schedule). You can then follow this up by announcing the prerequisites on the first day of class. Another approach is to check the prerequisites prior to course enrollment. At some universities, students can register using a computerized registration system that checks for prerequisites. Students who do not meet these prerequisites are not allowed by the system to enroll in the course.

You can also be less rigid in your insistence on prerequisite course. Often students have taken the courses, but it was at another institution with different course expectations, it was a long time ago, or they did not do very well in the prerequisite courses and they may not have learned the specific concepts that you are depending on. If this is the case, you may need to think about how to compensate for lack of preparation. If the course level is low to intermediate, you may wish to spend more time on the foundation material in Chapters 1-5. This will require that you in turn decide what topics you will cover in the remainder of the course and at what depth you will cover those topics. For a higher level course, you may spend less time covering the basic material in chapters 1-5, and more time on class demonstrations and exercises.

Course Schedule

How you cover topics will be a function of the number of contact hours in a course and the course schedule. If you are teaching in a semester system, you will normally have 3 hours of student contact per week (48 hours of course contact over a normal semester). The hours are likely to be in three meetings (MWF) or two meetings (Tues-Thur) per week. If you are creating a course with some in class time and some internet based interaction you will need to decide which components would be most effective through which methodology. You will need to make other choices if your course is entirely internet based or offered over a videoconference to more than one location.

Make a list of the number of course meetings and their respective dates. Leave a separate line for each class meeting. Pencil in the exam dates (including the final exam) as well as days devoted to University, Federal, and State holidays. Then decide how many class sessions you are going to devote to each topic. If you are to use a demonstration in class or to show a film, note that on the outline.

Writing the Syllabus

A Syllabus should include the following:

I. Course title and identifying numbers (course number, semester, section)

II. Course Time and Location

III. Contact information for Instructor, Teaching Assistant, and Secretarial Support if appropriate
- Phone
- Fax
- Email
- Office location
- Office Hours
- Secretary's name and phone number

IV. Textbook information (Include Edition number and publication date

V. Course Details
- Official Course Description
- Course Policies
- Lectures and Class Attendance
- Exam Dates, Content, and Format
- Other Assignments

VI. Location of Syllabus and other resources on the Web

Sample Syllabi

A sample syllabus is also included as Appendix 1.

CLASS ISSUES

To Lecture or Not to Lecture

Why Should You Leave Lecture Behind

The lecture format is a common approach for undergraduate courses in physiological psychology. In this approach, you provide a set of readings for the students to complete during each week of the course. During each lecture, you organize a set of ideas and present these orally to your students. The lecture format is familiar to most faculty and it is efficient if you are concerned about introducing ideas not found in the textbook.

In large course sections, this approach may be the easiest means by which to communicate with your students, but although it has its benefits and its adherents, it may not be the most effective way to

encourage some of the higher-level aspects of learning. A major drawback to the lecture approach is that the communication tends to be in one direction-from instructor to students. This mode can reduce active discussion of concepts during class.

Lecture Supplements

How to Lecture More Effectively

Even a lecture should not be just the professor talking to the students. There are several strategies that can supplement and reinforce your course lectures by involving multiple styles of learning and by encouraging students to be actively involved in the classroom.

Spend class time discussing questions that students have about the content of their reading. Have students end or begin the class by handing in a note card or sheet of paper something that they are comfortable with in the material and something that is still unclear. You can also have students send you an email the day before class. This lack of time for preparation can be challenging for the instructor, but it also encourages student preparation and often makes class more interesting for the students and faculty alike.

Use Visual Aids to Illustrate Your Lectures

Overhead acetate transparencies are often created by publishers taking illustrations from the text and making them available for classroom display. There is a set of color transparencies based on materials in the Carlson text. These are in color and professionally prepared. These transparencies primarily contain figures and charts taken from the textbook.

With the advent of inexpensive color printers, it is possible for you to prepare your own color transparencies for use in class (These usually still cost from 50 cents to $1.50 to produce). Preparing your own transparencies will allow you to incorporate new materials into lecture and to alter old materials to suit your lecture purpose(s).

For information on preparing effective transparencies, see Appendix 2.

Student Handouts for In-Class Use

Depending on your departmental budget, you may wish to copy materials for students to pick up when they come to class, place materials on a course web site to be printed by students prior to class, or have students purchase a printed course packet. Course packets may be printed within the university or contracted to an outside vendor who will also negotiate any permissions necessary for copyrighted material. Course packets can be an excellent way to supplement your course and adjust it to the level of your students by providing support materials for weaker students, or supplementary materials for advanced students.

Some possibilities for inclusion in a course packet are:
- A list of specific objectives for each chapter.
- An outline of the class lectures. (This is especially easy to do if you are supporting your lectures with materials produced in presentation programs such as PowerPoint.)
- Blank diagrams for taking notes in lecture.
- Handouts with instructions and/or materials for activities to be done inside or out of class.
- Study Tips.
- Explanations of difficult concepts.
- Case studies.
- Instructor written materials.
- Book chapters or research articles (Be sure that you have the appropriate copyright permission from the publishers – even if you are the author of the published work.)

Do not assume that if you provide copies of your PowerPoint slides, that the students will not listen in class. Often, the necessity to copy words from the board or taking detailed notes is more distracting. Having the main points available with terms spelled correctly can make it possible for students to listen

and learn to take notes on the examples and details of the content as well as learn spelling connected with words spoken by the instructor.

You may wish to add materials from this Instructor's Manual to your course packet

Electronic Classroom Presentations

One lecture approach involves using an electronic presentation programs to create materials to support classroom activities and then use a microcomputer and video-data projector to display the lecture supplements.

Using PowerPoint for Lecture Outlines

Software programs such as Microsoft's PowerPoint™ allow you to create lecture slides on a microcomputer. While PowerPoint has many potential functions, most faculty use it to provide an outline of class content while they are lecturing. While this can assist students and faculty by encouraging structure in the presentation, this is only one way to use PowerPoint.

A simple slide might consist of a title and 3-4 text bullets (Figure P.1). Use this type of slide to create the lecture outline as well as to convey your lecture points.

Pharmacokinetics

Routes of Administration
- Intravenous (IV) injection
- Subcutaneous (SC) injection
- Intraperitoneal (IP) injection
- Oral Administration
- Inhalation
- Topical
- Sublingual
- Intracerebral
- Introcerebroventricular
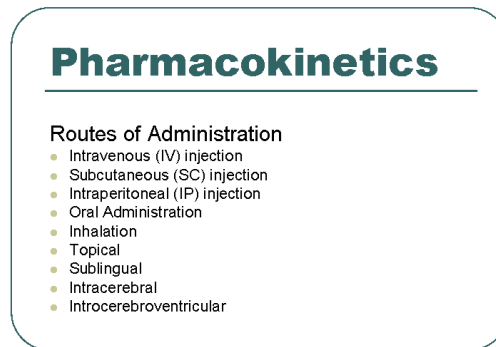
Figure P.1   An Example of a Title and Bullet Slide Created in PowerPoint

Just as you might write down a series of points to be made in a lecture, so too can you create an outline of major points in PowerPoint. Each major point becomes a slide containing either bulleted text or a combination of bullets and a figure. An advantage of this electronic approach is that you can insert figures, artwork, and photos onto the slide. With access to a color scanner, figures and charts can be scanned into electronic files that can in turn be inserted into a slide. It is also possible to place sound clips and/or movie clips onto a slide for presentation in the classroom. This allows you to create your own slides using a combination of text bullets, clip art, figures (from Carlson or other sources), and photos. An example of a PowerPoint slide consisting of a mixture of text and a figure is shown in Figure P.2.

A Basic Cell
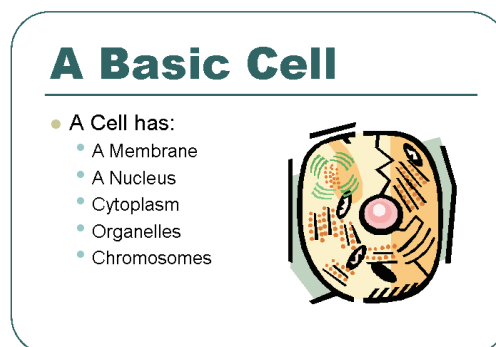
- A Cell has:
  - A Membrane
  - A Nucleus
  - Cytoplasm
  - Organelles
  - Chromosomes

Figure P.2   An Example of a Title and Bullet Slide Created in PowerPoint That Uses a "Clip Art" Image for Illustration.

Using PowerPoint for In-Class Activities

Provide introductory questions

Begin the class period with a question to be answered during the class period. Figure P.3.
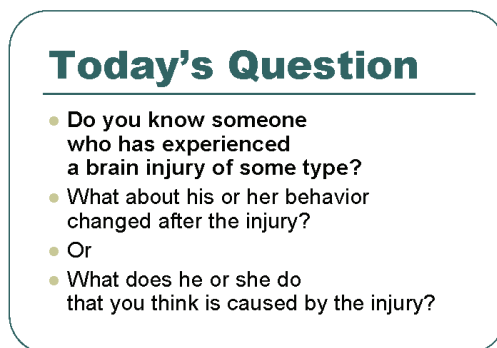
Figure P.3   Use PowerPoint to Pose Questions for the Class.

Summarize each section of the presentation.

Or stop and ask the students to write a brief summary of their understanding so far.

Introduce participation activities

Pair/Share - Ask students to discuss the current topic with the person next to him or her. Then randomly call on the pairs, there should be some preparation from the paired discussion making presentation to the class much easier for the students.

Provide stimuli and data analysis for in class research

Open a spreadsheet on a computer and project it to the front of the classroom.

Have a spreadsheet formatted for data entry and to display data as a graph on the same sheet. Enter data as students in the class report it. The graph will update automatically and the students can watch the changes in the data as the class reports.

For Example:

Teach the class how to take a pulse over a 30 second period that you time..
Have them begin counting heartbeats when you say "BEGIN!" and stop when you say "STOP."
Have them multiply this number by 2.
Then have half of the class close their eyes.
Present the following stimulus to the open eyed half of the class of the class visually.
Then have this half close their eyes and present the other stimulus to the other half of the class.

Instructions:

● **Close your eyes**

● Imagine the **most pleasant day** you have experienced.

● Who was with you?

● Where were you?

● What did you do?

● When I say "Open your eyes!" determine your heart rate.

Instructions:

● **Close your eyes**

● Imagine the most frightening event that you have experienced.

● Who was with you?
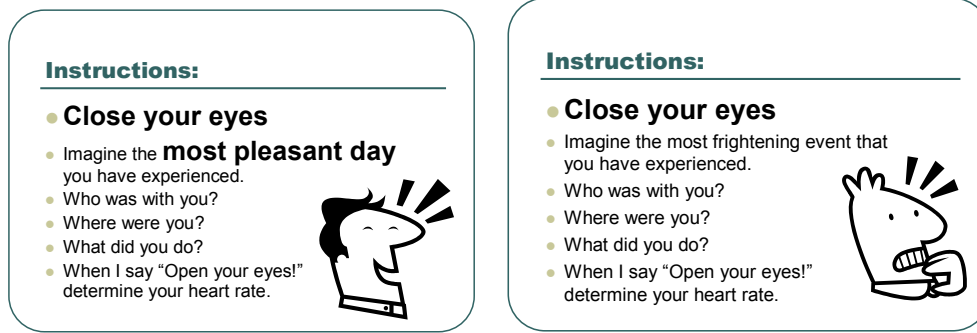
● Where were you?

● What did you do?

● When I say "Open your eyes!" determine your heart rate.

Figure P.4   Use PowerPoint to Give Instructions to the Class.

Then open an Excel File that you have prepared. As students tell you their heart rate, begin recording the values in the table so that the graph updates automatically. (You may wish to leave the variable labels off until the data have been reported. You will usually find lower heart rates/lower arousal levels in the section of the class imagining something pleasant. (You may wish to do a brief repeat of the pleasant exercise for the entire class to lower arousal levels for "frightened" students.)

Heart Rate Changes
with Arousal Increase

	Imagine Happy Event	Imagine Frightening Event
1	74	85
2	82	84
3	80	93
4	67	108
5	85	88
6		
7		
Average	**77.6**	**91.6**

Heart Rate Change with Increased Arousal Level
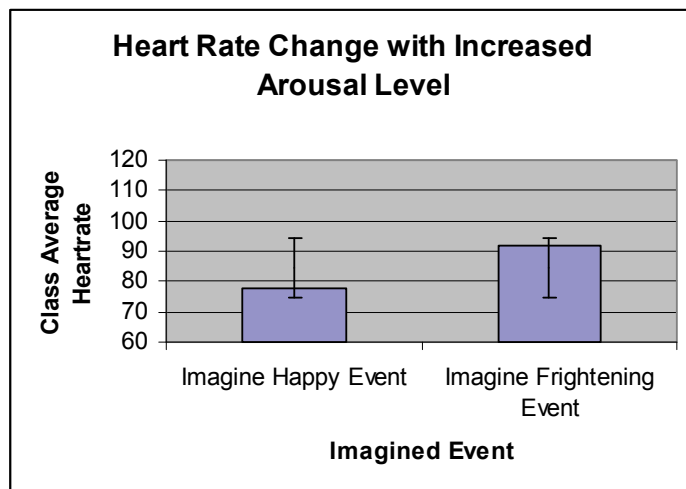
Figure P.5   An Example of a Data Table and Graphs in Excel

Ask Assessment Questions

Take time to ask the students how they are doing. You can use assessment questions to tap in to emotional reactions to content, the student's sense of relevance of the materials, impressions of course progress or problems, or evaluate learning through directed questions.

Even asking for a single word describing the day's class can be quite revealing.

Internet Resources and PowerPoint Presentations

The Internet is comprised of individual web sites containing hypertext and image files. A web site can be accessed via a browser such as Mozilla Firefox or Microsoft Internet Explorer. Search engines can be used to find resources for your course. The different search engines have access to different databases. Search engines include: Google, AltaVista, Yahoo, and many others. A search for web sites can use these engines or can use specialized engines that are tailored for a particular discipline. The Neuroscience Web Search engine can be found at: http://www.quasar.org/21698/knowledge/neuro.html . For an introduction to search engines, consult http://www.acsiom.org

The World Wide Web will allow you to bolster your course lecture content by incorporating web material into your lectures. New artwork, photos, or animations can be used to illustrate critical lecture concepts. The only caveat is to keep track of where you got the information (put the URL info on the slide) and do not violate copyright laws and guidelines. A warning about copyright policy as it pertains to PowerPoint. At the time of this writing, instructors can use textbook photos, artwork, and material from the Internet in their course presentations. Be sure to consult with your local institution to determine its fair use policy.

Help with PowerPoint from the Internet

Microsoft's Using PowerPoint Page:

Don't ignore the creators of a program for assistance in using it effectively. Microsoft makes resources available for getting the most out of PowerPoint. http://office.microsoft.com/en-us/FX010857971033.aspx

PowerPoint Uses

Rodenbaugh, D.W. Collins, H.L., & Dicarlo, S.E. (2002). Creating A Simple PowerPoint Multimedia Game *Advances in Physiological Education. 26*: 342-a-343-a, 2002;
"An educational game in pulmonary physiology for first-year medical students based loosely on the popular television game show, Jeopardy. The purpose of Pulmonary Jeopardy, was to provide a tool to review material previously presented in class. The game was developed using Microsoft PowerPoint. Educators with experience using PowerPoint and its capabilities to generate action buttons and text boxes and to apply action settings such as hyperlinks and sound events can easily generate similar games."

DESIGN PRINCIPLES FOR ACTIVE LEARNING

Active learning connotes an array of learning situations in and out of the classroom in which students enjoy "hands-on" and "minds-on" experiences (e.g., Benjamin, 1991; Brothen, 1986; Frederick, 1987). Students learn through active participation in simulations, demonstrations, discussions, debates, games, problem solving, experiments, writing exercises, and interactive lectures (Schomberg, 1986).

Active participation by students is a key component of active learning, but other features must be present as well.

1. Active learning should involve the entire class. Demonstrations, for example, that involve a few students may be active learning for students doing the activity but not for the class as a whole.

2. Active learning is most effective when students understand the relevance of the exercise to the subject matter at hand, to the content of their other course work, or to the events of the students' everyday life.

3. Active learning stimulates learning at higher cognitive levels (Wittrock, 1984). These methods require students not only to know and comprehend, but prompt them to apply, analyze, synthesize, and evaluate (Bloom, 1956).

4. Active learning methods vary in the time they require in class and out of class. An instructor can design short activities for a few minutes of class time or design an entire course with active learning as the sole learning practice.

5. Active learning exercises involve feedback to students (but not necessarily graded feedback). Such feedback may come from the instructor or from other students in the class, but it should be planned into the activity, ideally at the time of or soon after the learning experience. Out-of-class activities should involve feedback in a later class.

6. Active learning approaches must take into account student reluctance to participate. Teachers must respect students' right to privacy and not compel them to participate in activities that would have negative social consequences.

USING TECHNOLOGY IN THE PSYCHOLOGY CLASSROOM

Electronic Mailing Lists (Listservers)

Electronic mailing lists can be used to send messages to everyone on a list of e-mail addresses. First you must subscribe to the mailing list. This involves using standard e-mail to send a short subscription message directly to a server computer. That computer takes your e-mail address from the message and adds it to the list of addresses of persons who will receive mail sent to the list. Once you have subscribed to a mailing list, you can send a message to everyone on the list by simply sending it to the list address. Electronic mailing lists allow groups of people to carry on a discussion and share ideas.

TIPS, Teaching in the Psychological Sciences, is made up of teachers at the college and university level. TIPS can generate a large amount of e-mail but the group can be very helpful when you need a colleague to consult. To join TIPS, send the message:

subscribe TIPS *your name*

to the address:

listserv@fre.fsu.umd.edu

When you subscribe to an electronic mailing list, you will be sent a confirmation message that also gives you information on how to use the list (Where should you send messages and questions? How do you unsubscribe? Is the list moderated? Are there rules to follow if you belong to the list?). Be sure to read that message and save it for future reference.

(Psychology teachers tend to be fairly patient with people who are just learning to use the Internet, but when you make a mistake with a mailing list, your mistake may be sent to hundreds of people.)

Electronic mailing lists are a great way to use the Internet to get answers to your questions about the teaching of psychology. When you send a question to the list, you and the other list members can benefit from the experience of other list members.

The Internet and the World Wide Web

The Internet is a wonderful source of information that you need to learn to use

Since there are millions of document, it can sometimes be difficult to find what you are looking for. Search engines are programs that can help point you to the information you want, but a search engine may report that there are hundreds or even thousands of sites that meet the criteria that you provided. When you find a site of interest, be sure to record the name and URL or address for the site. Most programs for browsing the World Wide Web provide a "bookmark" or "favorites" function that allows you to keep track of the addresses of sites you expect to use again. Be sure to begin a system of folders or categories early on as you are likely to save hundreds of pieces of information in a short period of time.

There are other programs that can help you keep track of the information you find. Two that I have found very useful are **Image co-Tracker** and **Co-Cite**. These are both free windows programs that can be downloaded to your computer from the internet. One, *Image Co-tracker*, allows you to "grab" a copy of an image off of a web site and save it in a database that allows the creating of categories and that's automatically saves the web address of the location of the image. *Co-Citer* works in a similar way to save text from an internet document. These tools are great for keeping track of information for your courses or your professional work.

Using "Clickers" in the classroom

Many campuses have access to student response units, sometimes called "Clickers." In response to questions to the TIPS List, there is a nice collection of information posted by J. A. Skelton.[3]

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[3] http://www.dickinson.edu/~skelton/remotes.html

Information is available on these units from *Smart Room*[4]. Developers have put together game-like formats for use in the classroom to provide periodic assessment of student learning and to encourage active participation in the class. These systems can even be used to take paper exams providing instantaneous grading and feedback at the end of the exam instead of days later. One example is *Edugame* [5]

Student Assignments on the Internet

If you assign students to use the Internet, you must provide very clear guidance on how to maximize the results of the search for relevant information. You know more about looking for information than they do and you may need to guide them through the process. As with educational software, the instructor should go through the assignment and try to complete it to uncover any problems the students are likely to encounter.

Students may not be very selective when using Web resources. You may need to teach them how to evaluate the information that they find. Use *Handout P.1* on web search engines and *Handout P.2* on evaluating web sites with internet assignments to assure that students at least think about the information that they discover on-line. Do not assume that students have the technological and research literacy to find an evaluate information without direction and assistance. Students may have experience with computer games and word processing software, but be unfamiliar with pedagogical uses of the computer. The students must use the program to learn how to make use of it. Let students use the software, make mistakes, learn shortcuts, and encourage them to explore. Help them to deal with problems and frustration. Assure them that things are not necessarily easy for everyone. Explain what they are to learn from the process of using the software as well as explaining how to use it.

Select the software that you use carefully. Some programs are clever and entertaining but there is little content of value. Some times the student may only get one point, but if that is clear and easy to understand, the simple animation or the fifteen minutes with a program is worth doing.

The software may also be effective in demonstrating psychological principles but not flashy or entertaining. This does not make them useless, but makes the explanation of their value even more essential. Have the students assess their learning after using the software.

Use the software to facilitate learning, not just to be able to report that you use technology in your class. Think about what the activity will do for your students and their learning and keep track of your objectives for the course.

Handouts
Handout P.1   Doing Searches on the World Wide Web
Handout P.2   Using the World Wide Web to Collect Information for an Assignment

ASSIGNMENT SUGGESTIONS

Beginning Assignments

On the first day of class, you may wish to introduce the class to the concepts that you will be covering by bringing in an assortment of children's books on the brain and nervous system. The basic concepts and terminology are there and students can't really complain if you ask them to know more than they can find in a children's book.

These books are also good for projects where students check their accuracy against contemporary brain research.

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[4] http://www.smartroom.com/.

[5] http://www.theedugame.com/

You might also have students each prepare a children's book on a topic form the text. This helps them to get at basic concepts as they must rethink terminology and examples for a child's understanding, thereby helping them understand.

Here are some examples of books I have used in this manner. (Many are available on Amazon.com for less than $5.00.)

Treays, R., Fox, C., Mackintosh, & Cartwright, M. (1995). *Understanding Your Brain: Lifting the Lid on What's Inside your Brain*. Saffron Hill, London

Funston, S. & Ingram, J. (2005). *It's All in Your Head: A Guide to Your Brilliant Brain.* Maple Tree Press.

an exploration of the mysteries and wonders of the brain and its complex connections to the outside world. Playful illustrations by Gary Clement, the book provides answers to such baffling questions as "Can you make yourself smarter?," "How do I recognize my friends?," "Where do the words come from when I talk?," and many more. Engrossing experiments encourage young readers to "Try This" for hands-on learning, while "Brain Benders" get deductive muscles working at full power. A handy "User's Guide to the Brain" features a simple and accurate map of the brain's landscape, while "Last Thoughts" provide new ideas about the future of brain research.

Schultz, R. (1992). *Looking Inside the Brain*. Santa Fe, New Mexico.

Full-color, stock medical photos and bright cartoons, such as side views of brains with eyeballs on normal human bodies. The flashy illustrations are combined with solid information written at an advanced reading level on the anatomy, physiology, functions, and diseases of the brain.

Simon, S. (1997).*The Brain, Our Nervous System*. New York, NY.

This is a favorite of mine. It is a beautiful book about a foot square. There is minimal text with full color photos of terminal buttons, spinal cord dissection, PET scan, etcetera.

Reading Assignments

There are a number of books written for an educated lay public. Luria, a Russian, is one of the earliest practitioners of what has become Neuropsychology. Temple Grandin writes eloquently and with great insight about her experience as a person diagnosed with autism. Oliver Sacks is a well known Neurologist who is an excellent writer. Two case studies have become major motion pictures. **At First Sight** is a feature film based on "To See or Not See," a clinical tale in *An Anthropologist on Mars*. Starring Val Kilmer and Mira Sorvino it was. released by MGM, January 1999. **Awakenings** a film starring Robin Williams and Robert De Niro.. It was released December 1990 by Columbia Pictures and has been nominated for three Academy Awards Other cases are the basis for a PBS series, **The Mind Traveler** (September 1998). Episodes on "The Ragin' Cajun" (on a deaf-blind community in Seattle); "Island of the Colorblind" (on color and colorblindness in a small Pacific atoll); "Rage for Order" (on an autistic artist, Jessy Park); and "Don't be Shy, Mr. Sacks" (on Williams syndrome),. Ramachandran is a contemporary researcher who is involved in fascinating research on the brain, particularly phantom limb perceptions. These may interesting supplementary assignments for students and help them to see how their new understanding might be applied. Be sure you specify the goal for each reading assignment.

Books for Student Assignments

Cytowic, R. E. (1998). *The Man Who Tasted Shapes.* MIT Press.

Luria, A. R. & Solotaroff, L (Trans.) (1988). *The Mind of a Mnemonist: A Little Book About a Vast Memory.* Harvard University Press

Luria, A. R. & Haigh, B (Trans) (1973). *Working Brain: An Introduction to Neuropsychology*.

Luria, A. R. & Bruner, J. S. (1987) *The Man With a Shattered World: The History of a Brain Wound*. Harvard University Press.

Grandin T. (1996).*Thinking in Pictures: And Other Reports from My Life With Autism.* Vintage Books

Grandin, T. & Scariano, M. M. (1996). *Emergence: Labeled Autistic.* Warner Books.

Ramachandran, V.S. (1999) *Phantoms in the Brain: Probing the Mysteries of the Human Mind.* Quill.

Sacks, O. W. (1995). *An Anthropologist on Mars: Seven Paradoxical Tales.* Knopf Canada.

Sacks, O. W. (1990) *Awakenings*, Vintage Books

Sacks, O. W. (1984). *A Leg to Stand on.* Simon & Schuster.

Sacks, O. W. (1988). *Island of the Colorblind* Vintage Books

Sacks, O. W. (1987). *The Man Who Mistook His Wife for a Hat: And Other Clinical Tales.* HarperCollins

Sacks, O. W. (1990). *Seeing Voices: A Journey into the World of the Deaf.* HarperCollins

Group Assignments

Group Assignments are most effective when they mimic how we really use others in our work. Each group member must be able to contribute some expertise to the final outcome. This might be knowledge or experience with the project content or a skill such as typing, preparing graphics or videotaping the class presentation.

You may need to balance the strengths and weaknesses of the individual students as the groups are formed. One way to do this is to give the students parts of what is needed for the final project and require them to put it together.

One necessity is giving the students appropriate instructions and detailed information on how they will be evaluated.

Handouts

Handout P.3	Checklist for Group Projects: Classroom Presentation
Handout P.4	Evaluation Sheet for Group Projects: Classroom Presentation
Handout P.5	Evaluation Sheet for Group Projects: Web Site
Handout P.6	Individual Group Member Report
Handout P.7	Format for Group Report

Project Assignments

Independent projects can increase student's interest by allowing them to work on something with personal importance and can encourage the development of skills such as planning, problem solving, and creativity. They can also take time away from learning the core course content and are a prime source of plagiarism. Choose your goals carefully and design the project with the goals in mind rather than just adding a project to the list of assignments.

Suggestions for Assignment descriptions and grading criteria are available in the Handouts.

Handouts

Handout P.3	Checklist for Group Projects: Classroom Presentation
Handout P.4	Evaluation Sheet for Group Projects: Classroom Presentation
Handout P.5	Evaluation Sheet for Group Projects: Web Site

Peer Review of Papers and Projects

Have students review each others papers before they are turned in. This is a good experience for the reviewer and the reviewed.

Benos, D. J. Kirk, K.L., & Hall, J. E. (2003). A Personal View How to Review a Paper. *Advances Physiological Education. 27*, 47-52

Formal training in manuscript analysis is rarely, if ever, provided. The purpose of this article is to define how best to peer review an article. We will stipulate several principles of peer review and

discuss some of the main elements of a good manuscript review, the basic responsibilities of a reviewer, and the rewards and responsibilities that accompany this process. Proper reviewer conduct is essential for making the peer review process valuable and the journal trustworthy

WEB LINKS

This section will point students and faculty to interesting sites relevant to physiological psychology. Some of these sites will provide support material for faculty while others may be useful for demonstrations.

Resources on Teaching Psychology

Web Link P.1 **The Society for Teaching of Psychology**
http://teachpsych.lemoyne.edu/

Web Link P.2 **National Standards for the Teaching of High School Psychology**
http://www.apa.org/ed/natlstandards.html

Web Link P.3 **Goals and objectives for the undergraduate psychology major:**
Recommendations from a meeting of California State University psychology faculty
http://teachpsych.org/otrp/resources/resources.php?category=National%20Standard sThis document is available from the Office of Teaching Resources for Psychology.

Web Link P.4 **A Digital Library of the Biological Sciences for Biology Teaching.**
http://www.biosciednet.org/portal/
BEN portal is managed by the American Association for the Advancement of Science (AAAS). Over 1,000 reviewed resources covering 51 biological sciences topics are now available.

General Sources

Web Link P.5 **Neuroscience Tutorial**
http://thalamus.wustl.edu/course/
The Washington University School of Medicine
An illustrated guide to the essential basics of clinical neuroscience created in conjunction with the first-year course for medical students.

Web Link P.6 **Biocompare.com**
http://news.biocompare.com/
This site has a news page with articles of new research in biology (including neuroscience. You can subscribe to get a periodic email message with a listing of article links. These are brief and often very interesting.

Web Link P.7 **Neuropsychology Central**
http://www.neuropsychologycentral.com/
This is the best neuropsychology site I have been able to find. It has information about all strands of neuropsychology as well as links to organizations, newsgroups, jobs, assessment procedures and free neuropsychology software.

Web Link P.8 **World Wide Web Virtual Library for Neuroscience**
http://neuro.med.cornell.edu/VL/
A collection of neuroscience references

Web Link P.9 **Yahoo Neuroscience**
http://dir.yahoo.com/
Yahoo is one of the Internet's premier search engines—try health and science/biology directories

Web Link P.10 **Wisconsin/Michigan State Brain Collection**
http://www.brainmuseum.org/
A collection of images of mammalian brain sections

Web Link P.11 **The Whole Brain Atlas**
http://www.med.harvard.edu/AANLIB/home.html

A very impressive collection of human brain sections and MRI/PET images, normal and abnormal

Web Link P.12   **Neuralinks Plus**
http://spot.colorado.edu/~dubin/bookmarks/index.html
A long list of neuroscience links

Images

Web Link P.13   **Medical Image Database**
http://rad.usuhs.mil/synapse/index.html

Web Link P.14   **PowerPoint Lecture:**
http://www.houghton.edu/depts/psychology/phys1/Sld001.htm
This site provides a PowerPoint lecture on the introduction to physiological psychology.

Web Link P.15   **Biological Psychology Teaching Resources:**
http://psych.hanover.edu/APS/teaching.html#biological
This site from the American Psychological Society provides links to search engines, web link summaries, and research links for a course on physiological psychology.

Web Link P.16   **Biological and Physiological Psychology Links:**
http://psych.athabascau.ca/html/aupr/biological.shtml
This site from Athabasca University provides links to journals, magazines, search engines, image archives, and tutorials that are appropriate for a course on physiological psychology.

Web Link P.17   **Scientific American**
http://www.sciam.com/

VIDEO/MEDIA

Video P.1   **Movies of Brain Imaging**
http://news.wisc.edu/packages/emotion/media.html
This site provides movies taken from brain imaging studies. The movies can be downloaded for viewing within a laboratory or classroom.

Video P.2   **The Brain: Our Universe Within DVD Set**
http://shopping.discovery.com/product-54768.html
Join Dr. David Suzuki as he investigates evidence that our minds – thoughts, feelings, spirituality and creativity – are merely complicated networks of biochemical reactions.

Video P.3   **Stock photo and video database**
http://www.fotosearch.com/
If you are looking for a video clip to illustrate a point in a presentation, you might want to look for video clips at this site.

SOFTWARE

PDA Software

Software P.1   *Medical Mnemonics*
http://www.medicalmnemonics.com/
A searchable database of medical mnemonics to help students remember the important details. Developed by pdaMD from a database maintained by Robert O'Connor, a fourth year medical student at University College Dublin in Ireland. Freeware.

Windows/MAC Software

Software P.2   *Principles of Psychobiology: Interactive Study Guide for the Allied Neurosciences*
http://www.redreef.com/index.html
one of the highest rated multimedia study guides for students the brain sciences that

include biology, neurobiology, nursing, psychobiology, and all areas of the neurosciences. Principles of Psychobiology contains tutorials on all aspects of neuroanatomy and neurophysiology, and it also contains a brain atlas coloring book

Software P.3   ***3B NEUROtrainer™***

http://www.redreef.com/index.html

Over 800 anatomical terms and 110 accurate illustrations are waiting to be interactively used by you throughout this complex field of human anatomy. The unique quiz function and the clearly organized status of your study progress allow for steady planning of your study objectives

Software P.4   ***The Animated Brain (MULTIMEDIA CD-ROM)***

http://www.brainviews.com/index.htm

Theodore J. Voneida, Ph.D.

Richard M. Vardaris, Ph.D.

Over 90 narrated illustrations and 85 animations, 60 anatomical labeling exercises, 200 multiple choice and drag/drop questions with automatic scoring, interactive models, and video clips of behavior.

Topics: Neurocytology, Neuronal Communication, Development, Gross Brain, Sensory Systems, Motor Functions, Internal Control Systems, Thalamus, Cortex & Higher Integrative Functions, Cognition, Learning & Memory, Consciousness & the Mind and Biological Basis of Mental Disorders. Strong emphasis is placed on relationships between brain structure and behavior.

User Features: Master index, glossary of terms with hyperlinks, tutorial, on-screen hypertext with bookmarks, tracking and print features

Software P.5   **Brainiac! Interactive Human Neuroanatomy Atlas**

http://www.redreef.com/brainiac.html

Macintosh and Windows 95/98-compatible

Separate Gyri, Pal-Weigert stained sections from the spinal cord through the thalamus, Coronal and Horizontal modules.

Over 50 brain sections

Review and test modes with scoring in test mode

section map screens allow you to see all the levels of the brain at which a particular structure is located, functional neuroanatomy, color coding of structures by function, major system associations, afferent and efferent connections, Brodman maps in gyri module, "Follow structure" buttons allow you to quickly and automatically follow the course of a particular structure, Hint button in test mode, easy "point and click" interface.

Software P.6   **Neuroinformatics Workbench**

http://www-hbp.usc.edu/workbench.html

The 'Neuroinformatics Workbench' is a set of tools being constructed by the USC Brain Project to facilitate development of neuroscience databases and the integration of theory and experiment in neuroscience.

Software P.7   **Neuron**

http://neuron.duke.edu/

is a simulation environment for developing and exercising models of neurons and networks of neurons. It is particularly well-suited to problems where cable properties of cells play an important role, possibly including extracellular potential close to the membrane), and where cell membrane properties are complex, involving many ion-specific channels, ion accumulation, and second messengers.

Software P.8   **Brain Metric**

http://www.brainmetric.com/

Software P.9   **Clinical Neuropsychology** (MAC/WINDOWS)

http://www.brainmetric.com/

Software and assessments for neuropsychology including:

> **Clinical Neuropsychology**
> http://www.brainmetric.com/products/clneuro.htm
> **Neurological Illness** (MAC/WINDOWS)
> http://www.brainmetric.com/products/nill.htm
> An index of neurological disease. MAC/WINDOS
> **Medical Labs** (MAC/WINDOWS)
> http://www.brainmetric.com/products/medlabs.htm
> An index of medical laboratory tests.

Software P.10   Neuroscience Tutorial
> http://thalamus.wustl.edu/course/
> An illustrated guide to the essential basics of clinical neuroscience
> Created in conjunction with the first-year course for medical students.

Software P.11   AGNOSIA, APHASIA, APRAXIA and Related Terms for Cognitive, Behavioral and Neurological Disorders
> http://spot.colorado.edu/~dubin/talks/agnosia.html

For the Laboratory

These are traditional experimental programs to allow the presentation of stimuli and recording of responses. These can be used with physiological recording apparatus to compare physiological states (such as states of arousal.)

Research Software Companies

Software P.12   Psychology Software Tools, Inc.
> http://www.pstnet.com/products/e-prime/
> Publishes **E-Prime** for Mac and Windows

Software P.13   Cedrus Corporation
> http://Cedrus.com
> Publishes *SuperLab* for Mac and Windows, an experiment generator in psychology; a textbook; and related hardware and software.

Software P.14   Empirisoft Research Software
> http://www.empirisoft.com
> Makers of *MediaLab Research Software* and other tools for developing and conducting psychology experiments and surveys.

Software P.15   Life Science Associates (LSA)
> http://lifesciassoc.home.pipeline.com
> Publishers of instructional college level psychology software programs and equipment to assist cognitive rehabilitation.

Software P.16   Inquisit
> http://www.millisecond.com/

Software P.17   PsyScope
> http://psy.ck.sissa.it/
> MACFreeware Will not work with OS X on the Macintosh

Software P.18   Psychology Software Tools, Inc.
> http:/www.pstnet.com/
> Producing commercial-software products to facilitate the implementation of computerized experiments and enhance the teaching of psychology.

Software P.19   Psytech
> http://www.psytech.co.uk/
> Offers a full range of computer-based psychometric assessment software.

For the Classroom

Lecture Materials
Software P.20   ***Animations Disk to Accompany Carlson.***
The animations on this disk simulate neural communication, the action potential, the synapse, post-synaptic potentials, and psychopharmacology. Contact an Allyn and Bacon sales representative for details about this disk.

Simulations
Software P.21   **Action Potential Simulator**
http://sun.science.wayne.edu/~jram/axonsim.htm
This site provides a powerful simulation program of the ionic and electrical events that occur during an action potential. The simulator allows the instructor to demonstrate EPSPs, IPSPs, and the effects of toxins such as TTX and TEA on the membrane potential.

Software P.22   **Neurolab**
http://www.cai.cam.ac.uk/people/rhsc/neurolab.html
This PC software package is an ancillary to accompany RH.S. Carpenter's text entitled: Neurophysiology (3rd edition, 1996; Edward Arnold, London). The software can be downloaded from Carpenter's web site. This software allows for a variety of simulations ranging from ionic effects on membrane potential to retinal receptive

Software P.23   **Electrophysiology of the Neuron:**
http://tonto.stanford.edu/eotn/
This software program (PC or MAC formats) provides a simulation of the effects of manipulating electrophysiological parameters on resting potentials, action potentials, and postsynaptic potentials.

Image Editing Software
Photo-editing software.
These programs allow the user to import and alter images taken from the Internet or images scanned from a textbook. An image can be resized, recolored, or cropped. Most photo-editing programs will allow the user to save an image in a file format different from the original format. For example, Photo-Shop will allow a JPEG image taken from the Internet to be converted and saved in TIP (Tagged Image Format).). TIP images can be easily inserted into a PowerPoint slide. The differences between different types of image software are outlined well in and article at http://graphicssoft.about.com/cs/findsoftware/a/twotypes.htm .
Examples of Photo-editing software include:
- Adobe ***Photo-Shop***
http://www.adobe.com/products/photoshop/main.html
- Corel ***PhotoPaint***
http://www.corel.com/
- Google ***Picasa***
http://picasa.google.com/index.html
- Microsoft ***Digital Image***
http://www.microsoft.com/products/imaging/default.mspx

RESOURCES

Reference Books
Alcock, (1998). *Animal Behavior*, 6th Ed., Sinauer,

Beatty, (1995). *Principles of Behavioral Neuroscience*, Brown & Benchmark, 1995

Diaz, (1997). *How Drugs Influence Behavior: Neuro-Behavioral Approaches*, Prentice Hall.

Feldman, R S., Meyer, J. S., Quenzer, L. F. (1997). *Principles of Neuropsychopharmacology*, Sinauer.
    A very detailed, comprehensive, and scholarly text. A bit out of date but still very useful.

Funston, S. & Ingram, J. (1994). *It's All in Your Brain.* New York.

Grilly, D.M. (1989). *Drugs and Human Behavior*, Allyn & Bacon.

Hayes, (1996). *Principles of Comparative Psychology*, Psychology Press.
    Contains a well argued attack on sociobiology.

Kalat, J.W. (2001). *Biological Psychology*, Wadsworth.

McKim, W.A. (2002). *Drugs and Behavior: An Introduction to Behavioral Pharmacology*, Prentice Hall,

McKnight, (1997). *Straight Science? Homosexuality, Evolution & Adaptation*. Routledge, London &
    New York.

Manning, (1998). *An Introduction to Animal Behaviour*, 5th Edition. Cambridge University Press.

Nelson, (2000). *An Introduction to Behavioural Endocrinology* 2nd Edition, Sinauer.
    There are only a few books in this specialized area of psychology, and this is the best.

Pinel, (2002). *Biopsychology*. Allyn and Bacon.

Rathjen, D., Doherty, P., and the Exploratorium Teacher Institute. (1995). *The Cheshire Cat & Other
    Eye-Popping Experiments on How We See the World*. San Francisco: The Exploratorium

Rock, I. (1990). *The Perceptual World.* New York, NY.

Rosenzweig et al, (2001). *Biological Psychology*, Sinauer.

Schultz, R. (1992). *Looking Inside the Brain.* Santa Fe, New Mexico.

Simon, S. (1997).*The Brain, Our Nervous System*. New York, NY.

Slater, (1999). *Essentials of Animal Behaviour*, Cambridge University Press, Cambridge.

Toates, (2001). *Biological Psychology: An Integrated Approach*. Prentice Hall.

Treays, R., Fox, C., Mackintosh, & Cartwright, M. (1995). *Understanding Your Brain: Lifting the Lid on
    What's Inside your Brain.* Saffron Hill, London.
    Usborne Science For Beginners. This children's book is a great tool for students

Vannini, V. & Pogliani. G. (Jolly, R.T. Translator) (1980).*The Color Atlas of Human Anatomy. New
    York, NY:* Harmony Books.
    Excellent color illustrations of human anatomy

Blogs, Podcasts and RSS Feeds

One way to keep up with the news about neuroscience is to subscribe to a service that will send relevant news items to your computer. You will need software to receive the newsfeeds. Some is web based, others feed into *Microsoft Outlook*, still others are a separate reader on your computer. Search the web for the latest software.

Sites providing RSS feeds include:
- http://www.sciencedaily.com/subscribe/newsfeed.htm
- http://www.nature.com/neuro/current_issue/rss
- http://www.nature.com/nrn/current_issue/rss

Audiovisual Resources

There are varieties of resources that can be used to locate audiovisual materials such as films, videotapes, and laser disks relevant to a course on physiological psychology.

Audiovisual P.1 **Allyn and Bacon Software Video Publication Guide (1997).**
This guide lists the video resources available to adopters of Allyn and Bacon texts. The Guide also includes software that can support each course. Contact an Allyn and Bacon sales representative for more information about this guide.

Audiovisual P.2 **Biological Psychology: A Video Supplement, Allyn and Bacon, 2000.**
This videotape contains 14 segments devoted to topics ranging from genes to vision to language. The relevant video clips are listed below for each chapter.

Audiovisual P.3 **Films for Humanities and Sciences**
http://www.films.com
Box 2053, Princeton, NJ 08543-2053 1-800-257-5126

Audiovisual P.4 **PBS**
http://www.shoppbs.org/home/index.jsp
1320 Braddock Place, Alexandria, VA 22314-1698 1-800-424- 7963

Audiovisual P.5 **The Brain, Teaching Modules,**
Available at http://www.learner.org/resources/series142.html
The modules consist of thirty two five to twenty -minute segments on a variety of topics, of which some would be appropriate for a physiological psychology course. Footage and research into the inner workings of the brain, including findings on Alzheimer's disease, schizophrenia, autism, Parkinson's disease, and many other topics.

Audiovisual P.6 **The Mind: Teaching Modules**
Available at http://www.learner.org/resources/series150.html
The modules consist of thirty-five, five to twenty-minute segments on a variety of topics, of which some would be appropriate for a physiological psychology course. An extension of topics covered in *The Brain: Teaching Modules,* these programs explore cognition and human behavior. The modules present current findings on language processing, drug treatment and addictions, and cognitive development throughout the life span. The programs also cover mood and personality disorders, and pain and its treatment.

Audiovisual P.7 **Phineas Gage - A Man Who Hurt His Brain**
http://members.tripod.com/rsabbatini/phineas5.ram
RealSlideshow™
A Classical Case Which Helped Us To Understand Brain Functions in Behavior
Lecture by Dr. Silvia Helena Cardoso - State University of Campinas, Brazil

Audiovisual P.8 **Neurobiology of Perception and Communication: From Synapse to Society**
http://www.rice.edu/webcast/speeches/20010305delange.html
DeLange Conference IV

Audiovisual P.9 **"Mechanisms of Visual Attention in the Human Brain"**
http://realaudio.rice.edu/DeLange/Kastner.ram
Lecture by Sabine Kastner, Professor, Princeton University

Audiovisual P.10 **The stories at ScienCentral.com**
http://www.sciencentral.com
sometimes include interesting brief video clips and research findings

Audio-Visual Sets

Audiovisual P.10 **Basic Principles of Neuroscience**
http://lifesciassoc.home.pipeline.com/instruct/avsets/avsets.htm
William D. Willis, Jr., James Blankenship, Ph.D. &
Richard E. Coggeshall, M.D. Edited by H. M. Pinsker, Ph.D.
program consists of 13 units divided into two series. Each unit contains approximately 50 color slides that are individually keyed to the 45-minute narrative (cassette). Each unit is subdivided into three or four sub-units that deal with specific topics. Introductory slides list the basic concepts to be explained in that sub-unit. The text directs the student's attention to the critical features of the slide and

amplifies the principles that are graphically illustrated. The most important principles are repeated in different contexts to ensure mastery and generalization.

    Unit 1) Electrical and Chemical Concepts Basic to Neurophysiology
    Unit 2) Ionic Basis of Resting and Action Potentials
    Unit 3) Electrical Model of the Membrane
    Unit 4) Electrophysiology of Nerve Fibers
    Unit 5) Synaptic Transmission
    Unit 6) Basic Sensory Mechanisms
    Unit 7) Peripheral Nerve and Somatic Sensory Receptors
    Unit 8) Autonomic Nervous System and Visceral Sensation
    Unit 9) Responses to Injury of Neurons
    Unit 10) Spinal Cord Anatomy
    Unit 11) Motor Neuron Properties
    Unit 12) Spinal Cord Reflexes
    Unit 13) Cytology of the Nervous System

Laboratory/Demonstration Resources

The intent of a laboratory section is to reinforce and extend the concepts covered in lecture. A typical laboratory section might cover the following topics:

Neuroanatomy: Dissection of a sheep brain
Neurophysiology: Microcomputer demonstration of basic cable properties and ion contribution to action potential

Neuropharmacology: Adrenergic stimulation of brown adipose tissue thermogenesis.

Sensory systems: Microcomputer simulation of visual receptive fields

Feeding: Stereotaxic surgery and demonstration of PVN lesion-induced obesity in Rats

Drinking: carbachol-induced drinking in the septal region of rat brain

This Instructor's Manual provides coverage of laboratory/demonstration exercises for many chapters. Each exercise includes background citations, a listing of the materials required to carry out the exercise, procedures for the exercise, and where appropriate, alternate exercises.

In addition, the instructor may wish to consider adapting demonstrations from a variety of resource manuals including:

- Cooley and Vanderwoolf (1990). This manual provides a pictorial guide to the dissection of the sheep brain.
- Wellman (1994). A laboratory manual written to accompany Carlson's Physiology of Behavior. Topics covered include animal care, rodent anesthesia, stereotaxic surgery, and histology. Also covered are exercises in pharmacology and feeding.
- Bures, Buresova, and Huston (1983). An advanced laboratory manual covering histological techniques, behavioral assessment (feeding, locomotion, aggression), learning and memory, ablation and stimulation of brain, and electrophysiology.

A number of physiological psychology laboratory manuals are out of print but are important resources but you may find them in the campus library or in the personal library of a colleague. These include:

Resource P.1   Hart, B. (1976) Experimental Psychobiology: A Laboratory Manual 6
Resource P.2   Singh & Avery (1975). Physiological Techniques in Behavior Research 7
Resource P.3   Skinner, (1971) Neuroscience: A Laboratory Manual 8
Resource P.4   Webster, (1975)Principles of Research Methodology in Physiological Psychology9

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6 Hart, B. (1976). *Experimental Psychobiology: A Laboratory Manual*. San Francisco: Freeman,.

7 Singh, D & Avery, D.D. (1971). *Physiological Techniques in Behavior Research*. Monterey: Brooks/Cole.

8 Skinner, J.E. (1971). *Neuroscience: A Laboratory Manual*. Philadelphia: Saunders.

Resource P.5   Modular Lab Sessions for Physiological Psychology
> Thomas B. Perera, Ph.D.
>
> This series of modules, consisting of slides and cassettes, is designed to complement the lectures in an undergraduate or graduate-level course in physiological psychology. Each module covers a three-hour laboratory session and describes and shows in detail the procedures to be performed by each student group. The students work in pairs, alternating the responsibilities for the specific surgical procedures so that each student becomes competent in the performance of each procedure. Students carry out the laboratory procedures themselves after observing the slide presentations. The 12 modules have been used, tested and refined for many years at Barnard College. Each module is supplied with slides, cassette, a script, equipment lists, references, and names and addresses of equipment and supply vendors.
>
>> Unit 1) Basic Surgical Procedures
>> Unit 2) Tracheal Cannulation
>> Unit 3) Perfusion of Circulatory system, CNS Removal
>> Unit 4) Nerve and Muscle Physiology
>> Unit 5) Dissection of a Bovine Eye
>> Unit 6) Direct Observation of Human External Ear, Blind Spot & Retina
>> Unit 7) Exposure and Stimulation of Spinal Cord, Removal of CNS
>> Unit 8) Removal and Dissection of Lamb's Brain
>> Unit 9) Anatomy of the Human Brain & 3D Model
>> Unit 10 Stimulating and Lesioning Rat Brain, Follow-up Histology
>> Unit 11) Hypothalamic Electrode Implantation-Stimulation
>> Unit 12) Biofeedback, Human Electrophysiological Recording

Bertram J. E. A. (2002). Hypothesis testing as a laboratory exercise: a simple analysis of human walking, with a physiological surprise. *Advances in Physiological Education 26*. 110-119,

This paper describes a laboratory exercise designed to provide students with experience testing a hypothesis by systematically isolating and controlling determinant variables. The study involves an analysis of walking and is performed by the students on a subject from within their lab group. The study requires use of a motorized treadmill, tape measure, stop watch, metronome, personal cassette player, and calculator. The exercise is designed to include factors that the students are familiar with, so they can focus on the isolation of variables without being confused about the process they are investigating. However, the exercise will not turn out as the students anticipate, meaning they will be forced to reevaluate the assumptions that formed the basis of their original hypothesis. This exercise is designed for a college-level course in exercise science, physiology, or biology but could easily be managed by a high school honors class with appropriate guidance.

Sources for Laboratory Equipment
Laboratory Equipment P.1   Lafayette Instrument Company
http://www.licmef.com/

Lafayette Instrument Co. USA	**Lafayette Instrument Co. Europe**
3700 Sagamore Parkway North	4 Park Road, Sileby
PO Box 5729	Loughborough, Leics., LE12 7TJ. **UK.**
Lafayette, IN 47903 **USA**	Tel: +44 1509 817700
Phone: 765-423-1505	Fax: +44 1509 817701
Toll Free: 800-428-7545	Email: GPrescott@lafayetteinstrument.com

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9 Webster, W., (1975). *Principles of Research Methodology in Physiological Psychology*. New York: Harper and Row.

Wellman, P.J. *Laboratory Exercises in Physiological Psychology*. Boston: Allyn and Bacon,

Fax: 765-423-4111
Email: lic@lafayetteinstrument.com

Laboratory Equipment P.2   Vernier Software & Technology

http://www.vernier.com/
Vernier Software & Technology
13979 SW Millikan Way
Beaverton, OR 97005-2886
Fax: (503) 277-2440
Phone: (503)277-2299 or
(888) 837-6437

Bibliography of Resources for Assessment in Psychology

Allen, M. J., Noel, R. N., Deegan, J., Halpern, D., & Crawford, C. (2000). *Goals and objectives for the undergraduate psychology major: Recommendations from a meeting of California State University psychology faculty*. [On-line]. Office of Teaching Resources in Psychology [OTRP] Online. Available: http://www.Lemoyne.edu/OTRP/teachingresources.html

Developed by a task force of psychology faculty from the California State University System, this publication outlines eight general goals and associated learning objectives for the undergraduate major in psychology.

Baum, C., Benjamin, L. T., Bernstein, D., Crider, A. B., Halonen, J., Hopkins, J. R., McGovern, T. V., McKeachie, W. J., Nodine, B., Reid, P. J., Suinn, R., & Wade, C. (1993). Principles for quality undergraduate psychology programs. In T. V. McGovern (Ed.), *Handbook for enhancing undergraduate education in psychology* (pp. 17-20). Washington, DC: American Psychological Association.

Baum et al. outline a set of principles that characterize quality undergraduate psychology programs that are organized in three categories: students, faculty, and curriculum.

Brewer, C. L., Hopkins, J. R., Kimble, G. A., Matlin, M. W., McCann, L. I., McNeil, O. V., Nodine, B. F., Quinn, V. N., & Saundra. In T. V. McGovern (Ed.), *Handbook for enhancing undergraduate education in psychology* (pp. 161-182). Washington, DC: American Psychological Association.

After reviewing a proposed list of seven educational goals for the undergraduate psychology major, Brewer et al. describe aspects of the structure and content of the undergraduate curriculum that can address these goals. The chapter ends with a list of specific recommendations for curriculum planning.

Graham, S. E. (1998). Developing student outcomes for the psychology major: An assessment-as-learning framework. *Current Directions in Psychological Science, 7*, 165-170.

This article outlines the approach to assessment of student learning adopted by Alverno College. It also includes a description of expected learning outcomes for the psychology major.

Halonen, J. S., Appleby, D., Brewer, C. L., Buskist, W., Gillem, A. R., Halpern, D., Hill, G. W., Lloyd, M. A., Rudmann, J/ L/, & Whitlow, V. (2002). *Undergraduate psychology major learning goals and outcomes: A report.* [On-line]. American Psychological Association. Available: http://www.apa.org/ed/pcue/taskforcereport.pdf

This document is a report of the proposed learning outcomes for the undergraduate major in psychology developed by a task force of the Board of Educational Affairs (BEA). The report has been endorsed by the BEA and will be forwarded to the APA Board of Directors and the APA Council of Representatives for endorsement in the near future.

Halpern, D. F. (1988). Assessing student outcomes for psychology majors. *Teaching of Psychology, 15*, 181-186.

Halpern makes a case for the importance of assessing student learning in psychology as a tool for improving teaching and learning, including the key role that the discipline of psychology should play in assessment in general. She also suggests six general learning outcome areas for the psychology major and reviews assessment methods and approaches.

Halpern, D. F. in collaboration with Appleby, D. C., Beers, S. E., Cowan, C. L., Furedy, J. J., Halonen, J. S., Horton, C. P., Peden, B. F., & Pittenger, D. J. (1993). Targeting Outcomes: Covering your assessment concerns and needs. In T. V. McGovern (Ed.), *Handbook for enhancing undergraduate education in psychology* (pp. 23-46). Washington, DC: American Psychological Association.

In this chapter, Halpern et al. set forth a model of student-centered assessment. They also include a proposed list of outcomes for the undergraduate major in psychology and an extensive review of assessment methods, including advantages and disadvantages of each method, as well as suggested strategies for implementing and using a departmentally-based assessment program.

Korn, J. H., Sweetman, M. B., & Nodine, B. F. (1996). An analysis of and commentary on consultant's reports on undergraduate psychology programs. *Teaching of Psychology, 23*, 14-19.

Summarizes the results of a content analysis of consultant reports for 20 departments. Frequencies of 24 evaluation categories with respect to the occurrence of each as an issue, problem, or recommendation are reported and the role of external consultants in departmental review is discussed.

Levy, J., Burton, G., Mickler, S., & Vigorito, M. (1999). A curriculum matrix for psychology program review. *Teaching of Psychology, 26*, 291-294.

Using a proposed list of expected learning outcomes for the undergraduate major in psychology, Levy, et al. present a matrix approach that can be used to relate expected outcomes to courses in a department's curriculum. They argue that using this approach helps departments identify omissions, redundancies, and consistency across the curriculum.

McGovern, T. V., & Carr, K. (1989). Carving out the niche: A review of alumni surveys on undergraduate majors. *Teaching of Psychology, 16,* 52-57.

A good review of the importance and application of surveys of alumni as a component of an overall assessment program.

McGovern, T. V., Furumoto, L., Halpern, D. F., Kimble, G. A., & McKeachie, W. J. (1991). Liberal education, study in depth, and the arts and sciences major-psychology. *American Psychologist, 46,* 598-605.

Following a review of past reports on the undergraduate psychology major, McGovern et al. identify eight common goals of the undergraduate major in psychology and different models for the structure of the major

Messer, W. S., Griggs, R. A., & Jackson, S. L. (1999). A national survey of undergraduate degree options and major requirements. *Teaching of Psychology, 26*, 164-171.

Provides an overview of course requirements and degree tracks and specialties based upon a national sample of 292 catalogs from regional and national universities and liberal arts colleges.

Perlman, B., & McCann, L. I. (1999). The structure of the psychology undergraduate curriculum. *Teaching of Psychology, 26,* 171-176.

Similar to Messer et al. (1999), this study summarizes the characteristics and structure of the undergraduate major in psychology based upon a review of 500 college catalogs from several types of institutions

References

Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. New York: Longman.

Brothen, T. F. (1986). Using active learning in large classes. In S. F. Schomberg (Ed.), *Strategies for active teaching and learning in university classrooms* (pp. 40–46). Minneapolis: University of Minnesota Teaching Center

Bures, J., O. Buresova, and J.P. Huston. *Techniques and Basic Experiments for the Study of Brain and Behavior*. Amsterdam: Elsevier, 1983.

Cooley, RK and C.W. Vanderwoolf. *The Sheep Brain: A Basic Guide* 2/e. London, Canada: AJ. Kirby, 1990.

Fink, D. (2002). *Designing Courses for Higher Level Learning*. San Francisco: Jossey-Bass.

McKeachie, W. (1986). Teaching Tips. In Zanna & Darley (Eds.) *The Complete Academic*. New York: Random House

Makosky, V. P., Sileo, C. C., Whittemore, L. G., Landry, C. P., & Skutley, M. L. (Eds.). (1990). *Activities handbook for the teaching of psychology (Vol. 3).* Washington, DC: American Psychological Association.

Makosky, V. P., Whittemore, L. G., & Rogers, A. M. (Eds.). (1987). *Activities handbook for the teaching of psychology (Vol. 2).* Washington, DC: American Psychological Association

American Psychological Association Task Force for the Development of National High School Psychology Standards
http://www.apa.org/ed/natlstandards.html

Furman University and the APA Board of Directors, William Buskist, Auburn University, Angela R. Gillem, Arcadia University, Diane Halpern, Claremont McKenna College, G. William Hill IV, Kennesaw State University, Margaret A. Lloyd, Georgia Southern University and the APA Board of Educational Affairs, and Jerry L. Rudmann, Coastline Community College APA Staff Liaisons: Barney Beins and Martha Braswell

Abstract

"This document represents the work of the Task Force on Undergraduate Psychology Major Competencies appointed by the American Psychological Association's Board of Educational Affairs. The document outlines 10 goals and suggested learning outcomes that represent reasonable departmental expectations for the undergraduate psychology major across educational contexts. The goals are divided into two major categories: (1) Knowledge, skills, and values consistent with the science and application of psychology and (2) Knowledge, skills, and values consistent with liberal arts education that are further developed in psychology. The document concludes with a preliminary discussion of assessment principles and a proposal for developing appropriate assessment strategies based on the Undergraduate Psychology Learning Goals and Outcomes. This next step will be critical in promoting high quality learning experiences in the undergraduate psychology major."

www.apa.org/ed/pcue/taskforcereport.pdf

Handout P.1

Doing Searches on the World Wide Web

Looking for information on the web can be a real challenge. The number of web pages multiplies at an unbelievable rate. Popular topics may have hundreds of thousands of pages indexed. Efficient searching is an art as well as a practiced skill.

Most search engines use some form of Boolean logic. Think of words that would be in the text of a document on your topic. Try the most important term first. If the search gives you thousands of cites, you will want to narrow it by adding search terms. Many search engines will assume that there is an "and" between the words, that is, they will find documents only if the text or title contains all of the words in your search. For some search engines, you must put the word "and" or a plus sign "+" between terms that you want included. You may also be able to eliminate items by using "not" or a minus sigh "-" before a word. You may also be able to keep terms together, such as "brain damage" by putting them in quotation marks.

Most search engines also have an advanced search function that will allow you to fill in blanks to do elaborate searches. These can be very useful and will give you an idea of how the search engine looks through its database.

Be aware that like anything on the web, search engines come and go. Your favorite may disappear, only to be replaced by something different and not necessarily better. Keep your eyes open for new search options.

If you do a lot of web research, keep your eye on Search Engine Watch http://searchenginewatch.com/ for the latest information on using search engines.

You might also look at the article on this site titled *Power Searching For Anyone* at
http://searchenginewatch.com/facts/article.php/2156031
for some hints at finding what you want in this mass of information.

EXAMPLES

Below you will see examples of similar searches run on some of the most used search engines. Imagine you are looking for case studies on brain damaged people.

Each has its strengths and weaknesses. Unfortunately, none of them can link you to everything available on the Web today because of the rapid growth of sites.

Google
http://www.google.com

   brain damage case study found **3,880,000** results

   "brain damage" "case study" limited this to **74,700**

Altavista
http://www.altavista.com/

   This search engine includes Babel Fish which translates text & Web pages in 10 languages.

Lycos
http://www.lycos.com/

   brain damage case study found **849,184** results which included legal cases as well as psychological cases and references to the band "Brain Damage"

"brain damage" "case study" limited this to **10,197**

Yahoo

http://yahoo.com

This site can be used more like a "yellow pages" than a search tool. Sites are cataloged by topic and can be searched in this manner.

For example: <u>Directory</u> > <u>Health</u> > <u>Medicine</u> > **Neurology**

Or you can do the more typical search as suggested for the other search engines and find the following:

brain damage case study found **19,900,000** results

"brain damage" "case study" found **161,000**

Excite

http://excite.com

Excite searches in Google, Yahoo! Search, Ask Jeeves, About, Yahoo! Search Marketing, Miva

While it only found **81** documents for the search *brain damage case study*, it also gave a list of possible topics to narrow your search

- Agnosia
- Case Study And Brain I...
- Brain Damage; behavior

NOTE: The World Wide Web is expanding at an incredible rate.

These values are much larger than for the same searches just a couple of years ago.

For example:

The Google search done in 2004 found **333,000** results compared to **11,800,000** in January of 2006.but down to **3,880,000** in March 2009.

Wikipedia

http://wikipedia.com

Wikipedia is all the rage among kids these days. Some instructors encourage students to use it while others prohibit its use. As with any website, they key it to teach the students to evaluate the content critically. One study (conducted by the journal Nature and reported here: http://news.bbc.co.uk/2/hi/technology/4530930.stm) suggests that Wikipedia is as accurate as the Encyclopedia Britannica. Personally, I tell my students Wikipedia is a great place to start because it gives a general overview that is easy to understand. I also remind them that Wikipedia is incorrect in places and that is does not go into sufficient detail for all facets of my course.

Handout P.2

Using the World Wide Web
to Collect Information for an Assignment

Please turn in this sheet with your assignment.

Please give more than yes or no answers. Why do you answer the question as you do?

Turn in one sheet for each web site you use as a reference.

1. Where did you find the information for this assignment?
     (URL/s)

2. When was the information posted/updated?

3. Is the information current enough to be appropriate for this assignment?

4. Is this information part of a larger site?

5. What is the purpose of this site?

6. Who posted this information?

7. What are the credentials of the author?

8. Why do you think he/she posted the material for others to see?

9. Do you think that the information is correct or factual or might it represent some bias on the part of the author?

Handout P.3

Checklist for Group Projects
Classroom Presentation

This assignment requires the preparation of appropriate documents to provide information on a specific topic related to the physiology of behavior. A brief report from the group will be required for grading the group as well as submission of the final product. The best products will be stored in the Psychology Department for continued access.

The Objectives of the assignment are for students to demonstrate that they can:

- Define an audience for the assignment and prepare communication appropriate to that audience.
- Use appropriate tools and literature to do research to find material on a topic.
- Communicate clearly in a form appropriate to a group of individuals or a class.
- Understand one topic in depth.
  Demonstrate this understanding by preparation of materials and/or by citing appropriate references, or by writing an appropriate report explaining the materials.
- Work with other students, assigning tasks appropriately, managing the project, and producing an appropriate combined product that makes use of the skills and abilities of people in the group.

Your project should include the following:

I. Adequate materials for presentation of your demonstration to the class and to at least two other average size classes at the age of your selected audience.

II. Some type of handout explaining the phenomena involved for "the class" to take home.

III. Detailed instructions on how to present the demonstration including:
   A. How to prepare any stimuli that are necessary
   B. How to introduce the phenomena
   C. How to encourage discussion of the phenomena
   D. Background information for a teacher or presenter who has not taken the physiology of behavior course. This should include clear and comprehensible descriptions of the phenomena in ordinary language as well as a brief discussion of research or scientific evidence or explanation for the phenomena.
   E. References for materials describing the phenomena. (These should include professional literature, but may include www sites, popular books, children's books, and popular magazines if appropriate.)
   F. References for related materials (These should include professional literature, but may include www sites, popular books, children's books and popular magazines if appropriate.)

IV. A container for the material and handouts. (This can be a bag or box. It need not be fancy, but it should be an appropriate size and well labeled.)

Handout P.4

Evaluation Sheet for Group Projects
Classroom Presentation

This assignment requires the preparation of appropriate documents to provide information on a specific topic related to the physiology of behavior. A brief report from the group will be required for grading the group as well as submission of the final product. The best products will be stored in the Psychology Department for continued access.

The Objectives of the assignment are for students to demonstrate that they can:
- Define an audience for the assignment and prepare communication appropriate to that audience.
- Use appropriate tools and literature to do research to find material on a topic.
- Communicate clearly in a form appropriate to a group of individuals or a class.
- Understand one topic in depth.
  Demonstrate this understanding by preparation of materials and/or by citing appropriate references, or by writing an appropriate report explaining the materials.
- Work with other students, assigning tasks appropriately, managing the project, and producing an appropriate combined product that makes use of the skills and abilities of people in the group.

Grades will be computed on the following basis:

I. ___Depth and extent of content. (This will depend on the amount of content available in the area. Some topics deal with phenomena that have not been an extensive topic of research. In this case, research may involve related phenomena.)
  1. Depth and extent of content appropriate for topic and course level. (8 to 10%)
  2. Depth and extent of content appropriate for topic and course level, but minimal. (6 to 7%)
  3. Depth and extent of content limited for topic and course level. (4 to 5%)
  4. Depth and extent of content inadequate for topic and course level. (0 to 3%)

II. ___Evidence of understanding of content. (This may be expressed through good written descriptions, appropriate examples or illustrations, or detailed explanations)
  1. Content well understood (7 to 10%)
  2. Some of content understood (4 to 6%)
  3. Poor understanding of content (0 to 3%)

III. ___Content is essentially correct based on the available research, and materials do not appear to mislead the audience.
  1. Evidence supports the material presented and information is not misleading (8 to 10%)
  2. Evidence supports the material presented and information appear to be misleading (4 to 7%)
  3. Substantial inaccuracies or inconsistencies in the presentation. Lack of evidence to support the material presented and information is misleading (0 to 3%)

IV. ___Use of tools and skills to complete the project in an appropriate form.
  1. Completed to meet average expectations (10%)
  2. Problems with format (Not web pages, missing links, etc) (0 to 8%)

V. ___Appropriate presentation of material based on selected audience.
1. Audience defined clearly and material presented appropriately, taking into account such factors as background knowledge, vocabulary, and cognitive ability. (8 to 10%)
2. Audience defined clearly but material presented somewhat inappropriately (5 to 7%)
3. No clear sense of audience or consistent presentation (0 to 4%)

VI. ___Timely Completion of the Project:
1. Completed by due date (10%)
2. Completed before the semester end (5%)
3. Not complete until after the semester (0%)

VII. ___Good communication. (This includes correct grammar and spelling, proper use of the technological tools, good choice of language, proper use of APA style when appropriate, etc.)
1. Good communication used. (8 to 10%)
2. Minimal problems in some area (4 to 6%)
3. Many or severe problems noted (0 to 3%)

VIII. ___Evidence of good teamwork within the group.
1. All team members make substantial contributions and workload is well balanced. There is evidence of collaboration and cooperation (8 to 10%)
2. Most team members make substantial contributions and workload is somewhat distributed. There is some evidence of collaboration and cooperation (4 to 6%)
3. Most work appears to have been done by one or two team members, without substantial contributions by others there is no evidence of collaboration and cooperation (0 to 3%) for non-contributing members. (7 to 9%) for contributing member/s.

IX. ___Elegance of the completion of the assignment. (This represents accomplishments above the average that would be expected for an assignment of this type. Points are available in a number of areas.)
1. Project involves creative thinking and problems solving in its completion (0 to 5% of possible points)
2. Communication involves not only appropriate language, but text is well written, notably interesting, and easy to read. (0 to 5% of possible points)
3. Appearance of the project makes good use of principles of good composition and aesthetics. Colors go together well and reflect the topic or style of the material. Illustrations are attractive and appropriate. (0 to 5% of possible points)
4. Materials appear professionally prepared. (This requires use of appropriate tools and assessment of similar projects by professionals. (0 to 5% of possible points)

COMMENTS:

Handout P.5

Evaluation Sheet for Group Projects
Web Site

This assignment requires the preparation of appropriate WWW documents to provide information on a specific topic related to the physiology of behavior. A brief report from the group will be required for grading the group as well as submission of the final product. The best products will be posted on the Psychology Web site for continued access.

The Objectives of the assignment are for students to demonstrate that they can:
- Define an audience for the assignment and prepare communication appropriate to that audience.
- Use appropriate tools and literature to do research to find material on a topic.
- Communicate clearly in a form appropriate to the WWW.
- Understand one topic in depth.
  Demonstrate this understanding by preparation of materials and/or by citing appropriate references, or by writing an appropriate report explaining the WWW materials.
- Work with other students, assigning tasks appropriately, managing the project, and producing an appropriate combined product that makes use of the skills and abilities of people in the group.

Grades will be computed on the following basis:

I. ___Depth and extent of content. (This will depend on the amount of content available in the area. Some topics deal with phenomena that have not been an extensive topic of research. In this case, research may involve related phenomena.)
  1. Depth and extent of content appropriate for topic and course level. (8 to 10%)
  2. Depth and extent of content appropriate for topic and course level, but minimal. (6 to 7%)
  3. Depth and extent of content limited for topic and course level. (4 to 5%)
  4. Depth and extent of content inadequate for topic and course level. (0 to 3%)

II. ____Evidence of understanding of content. (This may be expressed through good written descriptions, appropriate examples or illustrations, or detailed explanations)
  1. Content well understood (7 to 10%)
  2. Some of content understood (4 to 6%)
  3. Poor understanding of content (0 to 3%)

III. ___Content is essentially correct based on the available research, and materials do not appear to mislead the audience.
  1. Evidence supports the material presented and information is not misleading (8 to 10%)
  2. Evidence supports the material presented and information appear to be misleading (4 to 7%)
  3. Substantial inaccuracies or inconsistencies in the presentation. Lack of evidence to support the material presented and information is misleading (0 to 3%)

IV. ___Use of tools and skills to complete the project in an appropriate form.
  1. Completed to meet average expectations (10%)
  2. Problems with format (Not web pages, missing links, etc) (0 to 8%)

V. ___Appropriate presentation of material based on selected audience.
  1. Audience defined clearly and material presented appropriately, taking into account such factors as background knowledge, vocabulary, and cognitive ability. (8 to 10%)
  2. Audience defined clearly but material presented somewhat inappropriately (5 to 7%)
  3. No clear sense of audience or consistent presentation (0 to 4%)

VI. ___Timely Completion of the Project:
    1. Completed by due date (10%)
    2. Completed before the semester end (5%)
    3. Not complete until after the semester (0%)

VII. ___Good communication. (This includes correct grammar and spelling, proper use of the technological tools, good choice of language, proper use of APA style when appropriate, etc.)
    1. Good communication used. (8 to 10%)
    2. Minimal problems in some area (4 to 6%)
    3. Many or severe problems noted (0 to 3%)

VIII.   ___Evidence of good teamwork within the group.
    1. All team members make substantial contributions and workload is well balanced. There is evidence of collaboration and cooperation (8 to 10%)
    2. Most team members make substantial contributions and workload is somewhat distributed. There is some evidence of collaboration and cooperation (4 to 6%)
    3. Most work appears to have been done by one or two team members, without substantial contributions by others there is no evidence of collaboration and cooperation (0 to 3%) for non-contributing members. (7 to 9%) for contributing member/s.

IX. ___Elegance of the completion of the assignment. (This represents accomplishments above the average that would be expected for an assignment of this type. Points are available in a number of areas.)
    1. Project involves creative thinking and problems solving in its completion (0 to 5% of possible points)
    2. Communication involves not only appropriate language, but text is well written, notably interesting, and easy to read. (0 to 5% of possible points)
    3. Appearance of the project makes good use of principles of good composition and aesthetics. Colors go together well and reflect the topic or style of the material. Illustrations are attractive and appropriate. (0 to 5% of possible points)
    4. Materials appear professionally prepared. (This requires use of appropriate tools and assessment of similar projects by professionals. (0 to 5% of possible points)

COMMENTS:

Handout P.6

Individual Group Member Report

Group Member's Name:_____

What percentage of this member's assigned work did he/she complete: _____ (0 to 100%)

How many out-of-class meetings did your group hold?:_____

How many of these meetings did this group member attend?:_____

If this group member missed a meeting, did he/she make efforts to contact the group and make up missed contributions?: _____ Yes   _____ No

If you were to assign a letter grade (A, B, C, D, or F) to this group member's contribution to the project, what grade would you give him/her?

_____ A   _____ B _____ C _____ D _____ F

Why would you assign this group member the grade you just assigned?:

Is there anything else you think I should know as I assess what grade to assign this person on the "Contributes effectively to group project" portion of the project grade?