15 Survival Strategies
By Dr. Peter Saunders

1. Prepare, Teach, Reflect, Revise
2. Set and Manage Learner Expectations and Behavior
3. Communicate Your Expectations Often and Stick to Them
4. Focus on Both the process of Learning and Mastery of Content
5. Create a Safe Learning Environment
6. Emphasize Time on Task
7. Learn Students’ Names
8. Be Professional and Friendly, but not Students’ Friend
9. Use Relevant Anticipatory Sets to Focus Minds and Hearts
10. Tap the power of Peer Pressure and Admiration
11. Engage Learners in Meaningful Activities
12. Vary lectures with In-class Activities
13. Integrate Technology Appropriately
14. Provide Feedback on Learning Often
15. Show Your Enthusiasm for Your Subject Area and HAVE FUN!

"The objective of education is to prepare the young to educate themselves throughout their lives."
- Robert Maynard Hutchins
COLLABORATIVE LEARNING

Definition: Approaches that engage students or students and teachers together in joint intellectual effort. Most of the time, learning occurs in groups and through active peer effort with the teacher assuming the role of "coach" or "facilitator." (Smith & MacGregor, 1992)

Background: Educational psychologists such as Piaget (1954), Bruner (1966), Freire (1970, 1989), and Dewey (1981) have proven that for effective learning to occur, students must be involved and active in the learning process. Collaborative learning enables students to learn course material at a deeper level of understanding such as those found in Bloom's Taxonomy levels, comprehension (interpretation and translation), application, analysis, synthesis, and evaluation. Collaborative learning requires internal processing of information rather than just memorization of facts. Collaborative learning is the best approach in the effective teaching of all learning styles. The interactive learning methods enhance the comprehension of course content by students with varying learning styles, thinking styles and multiple intelligences.

Basic Elements of Collaborative Learning (Johnson, 1991):
1. Positive Interdependence
2. Face-to-face promotive interaction
3. Individual accountability
4. Interpersonal and small group skills
5. Group processing

Forming Groups:
1. Do not tell students to "get into groups". Students will select their friends. Some students will always be "left out". We do not want students to feel awkward. Students always need to feel comfortable in class.
2. Assign the groups based on various goals of the groups. Sometimes you can number the students off and then have all of the one's form a group with the two's forming another group and continuing until all numbers are in groups.
3. You may create heterogeneous groups that encourage students to understand each other better.
4. Assign roles within the groups to discourage one student becoming a "sponge".
5. If you do not assign a role, randomly select group members to report on the work.
6. Groups should never be more than 5 students.
7. Group members should never have three or more members lined up horizontally. Have members facing each other. If students are in desks, move desks in a circle so that they touch each other. If one student has a desk that is apart from the circle, that student will likely not be involved in the group discussion.
8. Students may be placed in permanent and semi-permanent groups during the semester. Students who work in groups experience a community. In community colleges, this learning community feeling occurs in the classroom. Students who experience a learning community are less likely to drop out. (Tinto, 1987).
ININVOLVING STUDENTS IN A
LECTURE COURSE

Stop and Think and Explain:
Occasionally during the lecture, have students turn to the person sitting next to them and
explain why this particular concept (that was just explained in the lecture) is important to
know. How does this concept connect with today? How can you use this concept?
How does this concept relate to the course topic?  5 minutes

Muddy Water:
At the end of the class, have students write the concepts from the lecture that were the
most confusing for them. Have the students give those to you as they leave the
classroom. Start your next lecture explaining those concepts. 5 to 10 minutes

What Do You Really Know?
At the beginning of the lecture, have students take a sheet of paper and fold it into three
parts. Have students write the lecture topic at the top of the page. Then have students
write what they know about the topic in the first column. Have students write questions
that they may have about the topic in the second column. Then at the end of the lecture,
have students write in the third column the information they learned on that topic.
10 minutes

Do You Know What I Know?
At the end of a section of the lecture, have students close their book. Then tell them to
write a question about a point that was just lectured on. They need to know the answer
but not to write the answer down. Then have the students pass their written question to
the student on their left. That student should write their answer to the question and return
the question and answer to the original student. That student will then check off the
answer if it is correct or write the correct answer and show the student the correct answer.
This is an excellent activity for math classes. 10 minutes

Collaborative Techniques Explained In This Hand-Out That Can Be Used In
Lectures:
1. Round Robin – periodically during the lecture, stop and ask students to generate a list
of the important information from the lecture without looking at notes or textbooks.
2. Note-Taking Pairs – at the end of the lecture or during the lecture, have students
compare their notes with the person sitting on their right.
3. Grid – distribute a grid with topics and main ideas of the course information. Have
students complete the information.
4. Think-Pair-Share – After lecturing on a topic, present a question such as “Explain the
main idea behind ______.” Ask student to think about it and then explain their answer
to the student on their left.
5. Word Webs – Ask students to generate a list of related ideas on a topic from the
lecture and then draw lines to represent the connections.
Collaborative Techniques
Adapted from Barkley, Cross and Major

Techniques for Discussion
1. Think-Pair-Share
   Instructor introduces a topic with a question. Students are asked to share their
   thoughts about the topic with other students in the group.
2. Round Robin
   A brainstorming activity that encourages students to generate and share ideas.
   A great method for students to hear many viewpoints on a topic to “jump-start”
   their own thinking.
3. Buzz Group
   Small groups of students respond to questions on course topic. Groups generate
   topic information and ideas in a short period of time.
4. Talking Chips
   Ensures equal participation by requiring each speaker in group to surrender a token
   when sharing thought concerning topics.
5. Three-Step Interview
   Pairs of students interview each other and then report to other pairs. Interviewers
   listen carefully without imposing their own opinions. Then the interviewer must
   synthesize responses to share with other students.
6. Critical Debate
   Students must select the opposite side of their own belief. Requires students to
   comprehend and analyze other viewpoints on course subjects. Students will
   deepen their understanding of information.

Techniques for Reciprocal Teaching
7. Note-Taking Pairs
   Students share and discuss notes taken in class or on reading assignments. Student
   pairs work together to add or enhance individual notes.
8. Learning Cell
   Individual students develop questions from a lecture or reading assignment. Student
   pairs work together to add or enhance individual notes.
9. Fishbowl
   An outer circle of students sits around a smaller circle of students. The smaller circle
   discuss class topics in-depth while outer circle takes notes and listen so they can
   critique and discuss the discussion.
10. Role Play
    Students actively apply knowledge to engage in “learning by doing”. Students
    assume a role and must demonstrate their knowledge by actively applying
    an understanding of the topic.
11. Jigsaw
    Small groups discuss a topic and then devise methods of teaching this topic to other
    students. The group breaks up and each “expert” member goes to another group
    to teach the topic.
12. Test-Taking Teams
Small groups of students study for an exam. Each student takes the exam individually. Then the students regroup to take the exam together. This technique encourages a deeper understanding of material.

Techniques for Problem Solving
13. Think-Aloud Pair Problem Solving
Student partners have roles of “problem solver” and “listener”. The problem solver discusses the steps in solving a problem. The listener provides suggestions if the steps are unclear. This technique emphasizes the problem-solving steps rather than the final product.

14. Send-A-Problem
A group of students will solve a problem and pass the problem to another group. The next group will solve the same problem without looking at the solution of the last group. The last group will analyze their solution and the solutions of the previous groups and report and explain the best solution to the class.

15. Case Study
An excellent way of relating theory to reality. Student groups study and analyze cases by applying course concepts.

16. Structured Problem Solving
Groups of students will solve a complex problem within a given amount of time. Students learn to identify, analyze and solve problems in an organized manner.

17. Analytic Teams
Group members have assigned roles of summarizer, connector (relates information to prior knowledge or outside world), proponent, and critic. Roles are assigned prior to lecture, reading assignment of viewing video. Members will discuss information based on their role.

18. Group Investigation
Student groups plan, conduct research, and report on in-depth research projects.

Techniques for Using Graphic Information Organizers
19. Affinity Grouping
Individual students will generate and write ideas on a given topic. Groups will be formed and the ideas will be shared. Group members will organize ideas into categories as they generate common themes.

20. Group Grid
Instructor provides a grid with concepts listed in columns and/or rows. Groups will complete grid from information in the text, lecture or scrambled lists from the instructor.

21. Team Matrix
Groups are asked to discriminate between similar concepts by marking on a chart the presence or absence of defining features.

22. Sequence Chains
Groups identify specific points in a series and then apply knowledge and reasoning to arrange these points in a logical sequence.
23. Word Webs
Groups will generate related ideas of central work, phrase or question, provided by the instructor. Concept maps will be drawn using arrows and lines to connect the ideas and the topic.

**Techniques Focusing on Writing**

24. Dialogue Journals
Journals are kept by individual students in which they write about a reading, lecture, or experience. Students then exchange journals and respond to entry of other student.

25. Round Table
Groups are given a written prompt. The prompt is passed within the group with each member writing a few words or phrases on the same sheet of paper.

26. Dyadic Essays
Individual students write an essay question and an answer on a reading assignment, lecture or other activity. Students exchange questions and write answers and then discuss.

27. Peer Editing
Using a peer review form, students will review and provide feedback on a partner's paper.

28. Collaborative Writing
Student pairs will write a paper together following steps and procedures defined by the instructor.

29. Team Anthologies
Student teams compile, annotate, prepare and print an anthology if course related Materials.

30. Paper Seminar
Students make presentations of a paper within small groups. A couple of group members act as formal respondents to the paper.

“Education is more than filling a child with facts. It starts with posing questions.”
– D.T. Max
THINK-PAIR-SHARE
Discussion Technique
adapted from Barkley, Cross, and Major

Instructor:
1. Prepare a question that has many responses and requires students to evaluate, synthesize, or analyze.
2. Plan on how to present the question to your students...write it on the board, overhead, or orally, etc.
3. Plan on how you expect students to respond.....one will respond verbally or in written format or both will respond.

Steps:
1. Present the question.
2. Have students find a partner.
3. Pairs will discuss question and their individual answer. The answers may differ. Hopefully, through discussion they will develop a joint answer.
4. Students will provide their answer with justification and explanation in format determined by instructor (see #3 above).

Disciplines:
Hybrid Class: On one day of the week, the instructor posts three questions online that require students to read, understand, and apply concepts from readings that will prepare them for the next week’s in-class activities. Partners must work together to answer the questions before class meeting. During the first 10 minutes of the class, the partners meet as a quad to discuss their answers and prepare a group answer sheet.

Online Variation:
1. Assign student pairs to work over an extended time period (one week, three weeks, the entire semester, etc.).
2. Post the question on the discussion board or assignment page.
3. Students will work with their partner to develop their respond.
4. One student will provide written response to the instructor.
ROUND ROBIN
Discussion Technique
adapted from Barkley, Cross, and Major

Instructor:
1. Create thought provoking questions or problems that can be quickly answered with varied responses.
2. Practice to determine how many responses you can create and the time that it takes you. This will give you an idea of the amount of time to give students

Steps:
1. Place students in groups of four to six.
2. Ask for one group member to volunteer to be the recorder of information.
3. Discuss “brainstorming” with the students. They need to know that brainstorming is a sharing of ideas and that the purpose is for the groups to generate as many responses as possible.
4. Explain that one student in each group will begin by stating an idea or answer aloud. Then each group member will respond. You may specify to students that they should answer in clockwise direction. You may explain that they will respond to previous member’s comments or that they need to present a new idea or thought. Every group member will respond.
5. You must tell the students if you expect them to go around more than once. Be sure to give them a time limit.
6. This activity can be very quick and can be done in 5 minutes.

Purpose:
1. To help students generate lists, review material, or to think ahead of material to be discussed.
2. A great method for students to learn terms that need to be memorized.

Disciplines:
1. Sciences: Terms and lists that need to be memorized.
2. Math: Formulae that need to be learned
3. ESL: Repetition of words and phrases that need to be learned.
4. Foreign Languages: Repetition of words and phrases that need to be learned. Entire sentences and phrases can be created. One student will start with one word, another student will add a word and so on until a complete sentence is formed.

Online:
1. Students can post an idea or thought.
2. Another student will post a new idea.
3. There will be a new idea from each student.
4. Students should not agree, disagree or question what has been posted by others.
5. Remember, this is brainstorming. Students must realize that there are no right or wrong answers in brainstorming.
6. This can be done in chat room or on a discussion board within a certain time frame.
BUZZ GROUPS
Discussion Technique
adapted from Barkley, Cross, and Major

Purpose:
1. Introduction to material to be discussed in class.
2. Students will only exchange ideas. They will not develop answers.

Instructor:
1. Create prompts that encourage thinking of the subject to be discussed in class.
2. Try to respond to the questions to yourself to determine if discussion of these will enhance the understanding of the lesson material.

Steps:
1. Place students in groups
2. Give the students the prompt with the time limit for the discussion of the prompt.
3. Tell students that they will exchange ideas in response to the prompt.
4. Walk around and listen to the discussion in the groups. If you hear that students are not on subject, shorten the time limit. If the time limit is exhausted, but students are still discussing material, provide a longer time limit.
5. At the end of the time limit, have students return to their discussion seats and begin class discussion with the prompt.

Disciplines:
Works well with all disciplines to encourage students to think about topics. Can be used with lecture classes as well.

Online:
1. Form groups of 8 to 12 at the beginning of the semester
2. Post discussion prompts on the group forums and require each student to respond at least twice.
3. One response may be to the prompt and one to another student's response to the prompt
Purpose:
To allow all students in a group to speak without one student dominating the group discussion.

Instructor:
1. Create a question for group discussion.
2. Collect items that can be used as tokens. You should have enough items to give each student 3 to 5 tokens. Tokens can be paper clips, poker chips, or any other small item.

Steps:
1. Place students in groups.
2. Each student will be given 3 to 5 tokens.
3. Give students the question or topic to be discussed.
4. When each student responds to the question or topic, they will surrender one token. The tokens will be placed as to be visual to all in the group.
5. Specify that discussion will be over when all tokens have been surrendered.

Disciplines:
Calculus: Give each student a poker chip. Pose a problem to either students in a group or in the entire class. Give problems to the groups and when students make a comment, pose a question, solve part of the problem or question another student's comments, their poker chip is placed into a stack in the middle of the group. When the poker chip is gone, the student may not speak again until all chips are in the stack and redistributed.

Online:
1. Post a topic with policy of how many times a student can reply and the length of each reply.
THREE-STEP INTERVIEW
Discussion Technique
adapted from Barkley, Cross and Major

Purpose:
Bridges the gap between prior knowledge that the student brings to the class and information taught in the class.

Instructor:
1. Create interview questions
2. Examples:
   - What was the most difficult homework problem? Why?
   - What math formula is the hardest to learn? Why?
   - Which musician of today will people be listening to in 50 years? Why?

Steps:
1. Divide students into groups of four.
2. Then within each group divide into pairs.
3. Student A will interview B. Student C will interview D. The interviewer asks questions, listens, and probes for more information, but DOES NOT respond to information. After a certain amount of time, interviews will stop.
4. Then the pairs will switch the roles and interview the other partner for the same amount of time.
5. Students A and B will introduce each other with summaries of their partner's interview responses. C and D will do the same.

Disciplines:
Introduction to Music: “What musician recording today do you think people will still be listening to in fifty years, and why?” Students are placed in groups to interview each other on this topic. Groups will share their lists with class, as the instructor writes the information on the board. Then the entire class will discuss the characteristics that the musicians have in common to better categorize the musicians.

Online:
1. Place students into groups of four. Then subdivide into A/B and C/D.
2. Give the question.
3. Students must interview each other and then introduce and summarize the information received from their partner.
4. The difference between steps explained above and online is the time frame. Students online must be given a few days to respond.
CRITICAL DEBATE
Discussion Technique
adapted from Barkley, Cross and Major

Purpose:
Exposes students to varied viewpoints of the same topic.

Instructor:
1. Find a topic that has two opposing viewpoints.
2. Present the topic in lectures, discussion or texts. Students need to have some knowledge on topic before this activity.
3. Decide on the rules that expect students to follow:
   - how long will side speak?
   - how will you divide the class into teams?
   - will one person from each team speak or will all members talk?

Steps:
1. You may allow students to select which side of the proposition that they would like to represent. Then you will have students argue for the opposite side. The purpose is to help students analyze and develop a thorough understanding of the proposition.
2. Divide students into 4 to 6 member teams.
3. Give students time to discuss and organize their arguments. (15 to 30 minutes)
4. Tell students the amount of time each side will have to present their argument.
5. After arguments are presented, then give teams 10 to 15 minutes to prepare their rebuttals.
6. After the debate, a class discussion to summarize the important points will finalize the lesson. Allow students to express the experience of arguing opinions that they do not hold.

Online:
1. Prepare as listed above.
2. Provide students with a written explanation of the proposal and assignment directions.
3. Give students one or two weeks to read and research the propositions.
4. Open the forums to all students.
5. Then have the students read all of them
6. Give students an additional week to research and write rebuttals.
7. Have students post a follow-up on the discussion board and share their thoughts about their own viewpoints.
NOTE-TAKING PAIRS
Reciprocal Teaching Technique
adapted from Barkley, Cross and Major

Purpose:
As most students are poor note-takers, this activity allows students to share missed information, and correct their notes. This activity can be great for lecture classes, but also can be used for reading assignments.
Allows auditory learners to verbalize and repeat information.
Allows visual learners to add more notes and reread their notes.
Perfect activity for lecture courses.

Instructor:
1. Prepare an organized lecture
2. During the lecture speak slowly.
3. Use powerpoint, overhead or whiteboard to present detailed information and the main topics and subtopics of the lecture information.

Steps:
1. Students will take notes from the lecture
2. Place students with a partner
3. Partner A will summarize his/her notes while partner B provides additional information
4. Partner B will summarize his/her notes with partner A providing input.
5. You may want to periodically stop the lecture and give students 5 minutes to do this activity or you may want students to wait until the end of the lecture.

Disciplines:
Physics: Place students in pairs. Have students compare and discuss notes the last ten minutes of each lecture. Reassign students to a different partner after each exam.
Statistics: Students work with a partner to compile notes and submit both individual and collaborative notes as an in-class portfolio. Portfolios are due at midterm and at the end of the semester. Partners were changed at midterm.

Online:
1. Assign students a partner.
2. Assign a reading assignment
3. Have partners e-mail each other with the notes that they have taken

Excellent activity to ensure that students are covering the assigned readings.
Purpose:
To require students to analyze the content of the curriculum. When students create questions on the material, their understanding of the material deepens.

Excellent method of requiring students to not only read the text, but to understand the text.

Instructor:
1. Review how to write good questions with your students.
   www.4faculty.org/includes/107r1.jsp
   campus.murraystate.edu/academic/faculty/kevin.binfield/writingEssayExams.htm

Steps:
1. Have the students develop a list of questions on a particular part of the material. Students will write the questions individually. Tell students how many questions to write with a given time limit.
2. Place students in pairs.
3. Student A will ask a question. Student B will answer the question. Student A will provide corrections and explanations or clarification to Student B's answer.
4. Student B will then ask Student A a question. Step #3 will be repeated until all questions are answered.

Disciplines:
Art History: Ask students to develop two questions for each school of art such as Dada, and Expressionism.
Math: Students will write five problems using a particular formula.

Online:
1. Students can be placed in pairs and then required to e-mail each other with the questions and then the answers.
FISHBOWL
Reciprocal Teaching Technique
adapted from Barkley, Cross and Major

Purpose:
To allow students to participate in an in-depth discussion of course material.

Instructor:
1. Decide your role. Do you want to facilitate the inner circle discussion or observe both circles?
2. Prepare a topic or topics that will allow numerous viewpoints and answers.

Steps:
1. You will select 5 – 10 students to be the inner circle students. They will arrange their chairs in a circle. Then the remaining students will arrange their chairs around the inner circle forming an outer circle.
2. You will inform the students:
   - only inner circle students will talk
   - outer circle students will observe and take notes on material and discussion behavior
   - outer circle students will not talk during the discussion
3. The discussion topic will be given to the inner circle students. Give them a 5 to 10 minute time frame. You do not want to go longer as the outer circle students will become bored and stop listening.
4. Then ask all students to discuss the methods of discussion and then the topic that was discussed.
5. You may want to have the inner circle talk for 5 minutes and then have a new inner circle talk on the same subject for another 5 minutes. This will encourage the outer circle to pay attention as they may be called on next to move to the inner circle.

Online:
1. Assign students to inner circle and outer circle.
2. Assign the discussion topic
3. Allow inner circle to discuss for a week and then allow outer circle to make comments
4. Then switch the outer circle students to inner circle students.
5. Give them an extended discussion topic of the original topic.
6. Allow them a week for discussion.
7. Then have all students provide their observations as outer circle students.
ROLE PLAY
Reciprocal Teaching Technique
adapted from Barkley, Cross, and Major

**Purpose:**
Allows students to apply course information to actual activities.

**Instructor:**
1. Choose scenarios that capture the essence of the course concepts.
2. Decide the number of characters for each scenario.

**Steps:**
1. Assign students to groups.
2. Give each group information on the scenario for which they are responsible.
3. You may allow group members to decide who will do what.
4. Give students a time limit on the preparation of the scenario.
5. Provide students with the time restriction or other boundaries on the presentation of the scenario.
6. Have students discuss each scenario after the presentation.

**Disciplines:**
1. **Business:** Students will enact a job interview highlighting different personality types.
2. **History:** Students will interpret the roles of the American soldier, the German soldier and the French freedom fighter.
3. **ESL:** Students will enact ordering at a restaurant.

**Online:**
1. Assign roles privately to students.
2. Either have one student start the conversation in the Chat Room or you start it, so that it is obvious from the conversation who should be the next character to speak.

*The anonymity of the online role playing is a beneficial to those students who have difficulty speaking in front of people.*
JIGSAW
Reciprocal Teaching Technique
adapted from Barkley, Cross and Major

Purpose:
Allows students to take ownership of the material by having them teach it to others.

Instructor:
1. Develop topics that are simple enough for a student to explain to their peers, but complex enough to lead to discussion.
2. Develop a closure activity for students to reflect on what they learned.

Steps:
1. Divide students into groups of 4 or 5.
2. Give each group a different topic.
3. Groups will then have a specific time limit to read, research and discuss their topic.
4. Then the instructor will select one member from that group to move to another group to discuss that topic.
5. That “expert” will explain and discuss the topic to the new group. They will be teaching their topic to a group who has not studied that topic.

Disciplines:
1. Literature: Groups will be given different authors. Then an expert from each group move to another group to discuss that author.
2. Psychology: Groups will be given different theories. Then an expert from each group will move to another group to discuss that theory.

Online:
1. Place students into group forums.
2. Give each forum a topic and a deadline for discussion.
3. After the deadline, have one student move to another group forum to discuss the topic with the new group.
4. Students can use web pages and text documents to discuss the topic.
TEST-TAKING TEAMS
Reciprocal Teaching Technique
adapted from Barkley, Cross, and Major

Purpose:
To enhance knowledge of the course material through reflection and collaboration.

Instructor:
1. Prepare an exam over material covered in the classroom, assigned readings and/or assignments.
2. Determine the amount of time for the individual test and the group test.

Steps:
1. Place students in groups of 4 – 5.
2. Tell them to review for their exams. Give them a time limit.
3. Give students an exam to take individually.
4. Students will submit exams to instructor to be graded.
5. Before graded exams are returned to the student, have students return to the group from step # 1.
6. As a group the students should come to a consensus of the answers. These answers should be submitted as a group effort.
7. Both individual and group answers will be graded. The exams may be averaged with the individual exam counting as two-thirds and the group exam as one-third of the grade.

Disciplines:
1. Psychology: After the assigned reading and lecture, students are told to come to class with questions that they think will be on a short-answer exam. The first ten minutes they are placed in groups to discuss each other’s questions and review for the test. Students will then take the test individually and turn into the instructor. Then students are allowed to take the test with their group members.

Online:
1. Essay or problem solving exams work well online with this method.
2. Follow the same steps as above.
THINK-ALOUD PAIR PROBLEM SOLVING
Problem Solving Technique
adapted from Barkley, Cross, and Major

Purpose:
Depends students understanding of subject material as student must formulate ideas, understand the sequence of steps in their thinking and analyze another person’s reasoning.

Instructor:
1. Create problems that require students to analyze the course material.

Steps:
1. Place students in pairs.
2. Explain that one student will be the problem solver and the other student will be a listener.
3. The problem solver will read the problem aloud and talk through the reasoning Process in attempting to solve the problem.
4. The listener is to encourage the problem solver to think aloud as they describe the steps to solving the problem. The listener cannot solve the problem, but can ask clarification questions and offer suggestions.
5. Give the students a set of problems, so that the partners can switch roles for each problem.

Disciplines:
ESL: Students will talk aloud explaining diagramming a particular sentence.
Computer Programming: One student will explain steps in programming.
Math: One student will walk through a problem aloud. This is an excellent method for any math curriculum.

Online:
1. Place students in pairs.
2. Give the problem to one student and have them write out an explanation of the steps in solving the problem. They will send the explanation with the solution to their partner.
3. The partner will respond with corrections or comments.
4. Now, give a problem to the “listener” and have them do step # 2.
SEND-A-PROBLEM
Problem Solving Technique
adapted from Barkley, Cross and Major

Purpose:
Allows students to analyze, evaluate and synthesize course topics.

Instructor:
1. Determine the number of problems that you will need.
2. Staple or write the problem on the outside of the envelope.
3. Determine the amount of time to be given for each problem.

Steps:
1. Place students in groups.
2. Give each group one envelope.
3. Students will read the problem on the envelope and brainstorm for the solution.
4. Then one person from the group will write the group's solution to the problem and place it in the envelope.
5. Then the envelopes will go to the next group, so envelopes will move in a clockwise or counterclockwise motion.
6. When envelopes have moved to all groups, the last group will pull out all solutions and discuss the solutions. This group will be able to add any information they feel is lacking.

Disciplines:
Math: Great way to review and practice math problems.
Medical areas: Have students review symptoms, diagnose and recommend treatment.

Online:
1. Place students in groups. These groups will be placed in protected-access forums.
2. Give each group a problem. The groups will have a time frame to discuss problem.
3. They will then send their solution to you.
4. You will send their problem and solution to another group which will have a time limit to discuss and analyze the solution. There discussion of the problem can then be posted on the discussion board with the problem.
CASE STUDY
Problem Solving Technique
adapted from Barkley, Cross, and Major

*Purpose:*  
To bridge the gap between theory and practice and reality. Requires students to analyze, synthesize and to evaluate.

*Instructor:*  
1. Create case studies that can be real or hypothetical.  
2. Write the case to be distributed as a hand-out.  
3. Provide clear and concise explanations of what you expect from the student.

*Steps:*  
1. Place students in groups.  
2. Give each group a case study.  
3. Some case studies may require a short time of discussion within a class period; other case studies may require a few weeks.  
4. McKeachie (2002, p.200) suggests the following questions to guide students:  
   - What is the problem?  
   - What might have caused the problem?  
   - What evidence can be gathered to support or discount any of the hypotheses?  
   - What conclusions can be drawn? What recommendations?  
5. Students may either present a written or oral case study. The case study could include descriptions of observations, assessment, recommendations for a decision, and an evaluation.  
6. Groups may provide an oral explanation of the case study. Teacher and other classmates will discuss case study and group presentation.

*Disciplines:*  
**Government:** Instructor informs students of two countries that are going to war. Each group would be an ambassador with the responsibility of finding a diplomatic resolution. Each group would have to find support to provide their ambassador with the best arguments. Each group presents their resolution and the class will vote on the best.

**Online:**  
1. Organize students into teams and provide each with a closed-access forum.  
2. Give each team a case study and a time limit to present their analysis.  
3. The analysis will be posted in the whole class discussion board.  
4. After all case studies have been posted, all students will provide comments on all case studies.
STRUCTURED PROBLEM SOLVING
Problem Solving Technique
adapted from Barkley, Cross and Major

Objective:
This method provides students with a simple step-by-step procedure that allows them to think in sequence. This organized thinking requires students to identify, analyze, and solve problems in steps which provides students with a focus and a beginning step.

Instructor:
1. Create problems that require problem-solving skills.
2. Solve the problem yourself to determine if steps can be followed.
3. Develop a hand-out with the problems and the steps needed to solve the problem.

Steps:
1. Place students into groups.
2. Give each group a hand-out with a problem and the problem-solving steps.
3. The problem-solving steps may include these from The Dewey Six-Step Problem Solving Technique, Luotto & Stoll, 1996, pp. 91-92.
   1) identify the problem
   2) generate possible solutions
   3) evaluate and test the various solutions
   4) decide on a mutually acceptable solution
   5) implement the solution
   6) evaluate the solution
4. Groups will provide an oral report to the class. They will read the problem and then discuss the steps they followed to solve the problem.

Disciplines:
Music: Students are given the initial pages of a musical score that had the title, composer, and opus number removed. Students are required to find the missing information and identify the composition.
Chemistry: Students were given the problem of identifying the best antacids. After a lecture on acids and bases, students were required to use data from experiments to solve the problem.

Online:
1. In private chat rooms, instructor will give each group a problem and problem-solving steps.
2. Groups are given a time frame for their discussion of the problem.
3. One member from each group will post the group's problem and solution on the general discussion board.
4. Students will make comments on the problems and solutions.
Purpose:
Students have specific roles and tasks to perform when reading an assignment, listening to a lecture, or watching a video. These activities are passive and do not require the students to be actively involved; whereas, with analytic teams, students become actively involved and thus increasing understanding and comprehension.

Instructor:
1. Determine the roles that you plan to assign each group member.
2. Examples of various roles:
   - Proponents: List the points you agreed with and state why.
   - Critics: List the points you disagreed with or found unhelpful and state why.
   - Example Givers: Give examples of key concepts presented.
   - Summarizers: Prepare a summary of the most important points.
   - Questioners: Prepare a list of substantive questions about the material.

Steps:
1. Assign students to groups of four or five.
2. Give each student an assigned role.
3. Present the lecture, show the video or assign the reading.
4. Then give groups a time limit on completion of their discussion and written or oral presentation.
5. Each member of the group will present their interpretation from the view of their role.

Discipline:
All Disciplines:

Online:
1. Place students in groups.
2. Each group will be given an assignment (video clip or reading).
3. Each student within each group will be assigned a role.
4. Groups will be in private forums and will be able to discuss within those forums.
5. After an assigned amount of time, students will be asked to place their interpretation of the material based on their role on the discussion board.
GROUP INVESTIGATION
Problem Solving Technique
adapted from Barkley, Cross, and Major

*Purpose:*
This method is an in-depth study of a particular area. Students will work as a group following a series of steps within a time frame; thus, discouraging plagiarism associated with so many research papers.

*Instructor:*
1. Prepare the parameters of research topics and the method of presentation (written paper, CD-Rom, powerpoint presentation, oral presentation, a model, a skit, etc).
2. Decide the type of resources you will accept and the type of documentation that you will require.
3. You may want to assign roles to each group member. You may allow students to assign their own roles within the group.

*Steps:*
1. Place students in groups.
2. Groups need to brainstorm possible topics that are within the given parameters
   OR
1. Entire class will discuss possible topics.
2. Topics will be written on the board and discussed until a few topics remain.
3. Then groups will be selected based on the individual student’s interest in the topic.
4. Groups will need time to discuss topic and determine the roles of each group member
5. Groups need to follow steps such as:
   1) Determine research questions
   2) Determine the goal of their research
   3) Determine potential sources for the research material
   4) When they will meet next and how they will communicate and what do they need to have for the next meeting.
6. Assign students a time limit for the project with the method of presentation for the final report.

*Disciplines:*
*Biology:* Topics such as the invasive weeds in the Southern states, fire management in National Forests, or laws protecting rare and endangered plant species are presented. Students will select an interesting topic and that group will follow steps listed above.

*Online:*
1. Present topics on the discussion board.
2. Have students select one topic.
3. Place students into groups according to topic choice.
4. Assign each student a role within the group.
5. Break the research process into parts requiring portions or update on progress due at certain times with a date for the final paper to be posted online.
Purpose:
Enables students to identify and classify the components of a complicated topic.

Instructor:
1. Develop complex topics on from course curriculum.
2. Determine physical area so that students can work on flat surfaces moving index cards or slips of papers. Students may also use flip-chart paper posted on walls.

Steps:
1. Distribute index cards, slips of paper, or sticky notes. Each student will need several for the brainstorming activities.
2. Give the students the topic to be discussed.
3. Place students into groups and give them the time limit for discussion.
4. Ask each student to silently brainstorm ideas concerning the topic on an individual basis. They should write one idea per slip of paper. Students should write at least a minimum of five.
5. One group member should collect the cards or sticky notes, mix them up and spread them out on a flat surface.
6. Have groups discuss and arrange the cards or notes into related groups.
7. Have students create a title or heading for each grouping that best describes the theme of each group of items.

Discipline:
All Disciplines: Great method to teach students how to code qualitative data.
English: Composition course uses Affinity Grouping to help students brainstorm and organize ideas for writing assignment.
Students can brainstorm conflicts between characters, or developments in the plot of a novel.

Online:
1. Have students write ideas and develop a title for their ideas.
2. Students will post titles and ideas onto the discussion board.
3. Students will review the list of titles and read the postings of their classmates.
4. Students will then reply with suggestions for groupings.
5. Instructor will use the editing function of the discussion board to move the titles as suggested by the students.
GROUP GRID
Graphic Information Organizer Technique
adapted from Barkley, Cross and Major

Purpose:
Helps students learn and remember a large number of new terms, equations and any information that belongs in categories.

Instructor:
1. Determine course information that can be categorized.
2. Create a grid with horizontal columns and vertical columns.
3. Write out a list of items that belong in each category.
4. Write topics for columns to guide students.

Steps:
1. Place students in groups.
2. Distribute blank grid.
3. Have students complete the grid.

Disciplines:
Anthropology: Create a grid with the following across the top: name of the site where the fossil was found, the estimated age of the fossil, the material of the fossil, and the year that it was found. In the left column, write the fossil designation (Hexian, Zhoukoudian and Lantian). Students will fill in the information completing the grid.
Business: To help students organize and evaluate the arguments for different decisions, ask teams to construct and fill out a simple, two column pro and con grid for key topic areas in the introductory business course.

Online:
1. Place students in groups.
2. Send students a blank grid as an e-mail attachment.
3. Provide students with a time format to work on the grid.
4. Then have each group post their completed grids for entire class to view OR you may have the groups send you their completed grid to you and you will grade each grid individually.
TEAM MATRIX
Graphic Information Organizer Technique
adapted from Barkley, Cross, and Major

Purpose:
Students differentiate between concepts by determining whether criteria are present or not. Students will identify and make critical distinctions of related concepts.

Instructor:
1. Select two or three related concepts from your course curriculum.
2. Identify and list the features that differentiate the concepts.
3. Create a matrix with the concepts in the top row, and either the categories for comparison or the identifying features in the left column.
4. Create a blank matrix for students to complete.

Steps:
1. Pair your students
2. Distribute the blank matrix
3. Students will complete the matrix with their partner
4. Give students a time frame for completion

Disciplines:
History: Students differentiate and analyze the economics, politics, and formulation of policy from the two states' viewpoints.
Child Development, Education or Child Psychology: Students organize the characteristics, stages, and timing of normal development at various age levels. Use the matrix to record data of physical, social emotional, intellectual and language development in children they observe.

Online:
1. Send matrix as an e-mail attachment
2. Groups will work on matrix within a certain time framework.
3. Students will send completed matrix to instructor or post for classmates to view.
SEQUENCE CHAINS
Graphic Information Organizer Technique
adapted from Barkley, Cross and Major

Purpose:
Requires students to analyze and depict graphically a sequence of events. Students will produce a visual map of the logic within a series.

Instructor:
1. Decide the information or items students should organize into a sequence.
2. Determine if students will generate the list of items to be organized or if you will provide a jumbled list for them.

Steps:
1. Place students in groups.
2. Provide students with a timeframe for completing work.
3. Distribute the list of scrambled items OR provide students with an explanation of how to generate their own list of items.
4. Groups may then draw their sequences on flip-chart paper, then post these around the room and have students wander around to look at other teams' solutions.
5. Groups may then explain their sequences.

Disciplines:
Geography: Have students organize both the progression of events and the interconnectedness of people and places through converging processes of geological, cultural, economic, and political change. Example: Fill in a flow chart on the sequence of events describing how a Pacific high island is created and then transformed into a low island.

Computer Programming: Place students in pairs with one partner work through the steps of a program on the computer while other partner writes out the directions in simple, clear language. Then partners will switch places until all phases have a sequential list of directions written in language they understand.

Online:
1. Place students in pairs.
2. E-mail students a scrambled list of items to place in sequence using information from the text or from information that can be found on the Web.
3. Give students a week or longer to develop a sequence of the material and send to you.
WORD WEBS
Graphic Information Organizer Technique
adapted from Barkley, Cross and Major

Purpose:
This technique helps students analyze a complex concept by breaking it down into component parts and clarifying the relationships.

Instructor:
1. Determine a concept for students to map.
2. Determine the central word, phrase or question to be given as a beginning.
3. Decide what to use for as a shared writing space (flip charts or large sheets of paper).
4. Collect colored markers for students to use

Steps:
1. Place students in groups
2. Give the concept that is to be mapped to class.
3. Distribute the writing materials.
4. Explain the process to students.
5. Have students to brainstorm the concept.
6. Have students to write a list of terms and/or phrases that express main ideas and supporting details of the concept.
7. Have students sketch a diagram starting with the central idea and then have add primary, secondary, and tertiary associations.
8. Then have students connect the related items by drawing lines and arrows to show the connections.

Disciplines:
History: Groups were given the concept of “WWII’s effects on the continental United States”. One group identified women, education and the economy as core ideas. Then students identified and graphed details. Under education, the students listed affordable higher education for returning soldiers.

Online:
1. Software packages that assist in the development of concept maps such as Inspiration (http://www.engagingminds.com/inspiration/descript.html) might be useful for this technique.
2. Word processing software that includes drawing tools, with each person adding links in different colored fonts.
This technique may be difficult to do as an online activity.
DIALOGUE JOURNALS
Collaborative Writing Technique
adapted from Barkley, Cross and Major

Purpose:
Excellent method of having students record their thoughts and ideas about an assignment or course information in a lecture. Allows students to analyze and condense course information. When journals are exchanged and peers read the comments, then students are encouraged to discuss and explain course material.

Instructor:
1. Determine parameters for this exercise. When will journals be written? How will the journals be exchanged? What will be the roles of the students (critic or coach?)? Will journals be typed and e-mailed? Will journals be written in notebooks?
2. Develop a hand-out that will explain the specifics concerning the journal writing.
3. Develop topics. Will students write on specific course topics? Will students be allowed to write and comment on any material in the assignment or lecture?

Steps:
1. Have students draw a vertical line about 1/3 of the page from the right margin. The writer writes on the left side of the paper. The responder will write on the right.
2. The writer will write comments or questions after reading an assignment or listening to a lecture. Have the student date and sign the entry.
3. The writer will give the journal to the responder. The responder will read and respond with comments, suggestions, answers, questions and date and sign the entry.
4. You may then allow the peers to discuss the entry and the response.
5. Instructor may read the journals and comment on content of entries.

Disciplines:
Courses using videos: Have students write in their journals comments concerning specifics of the film and/or how they felt the film enhanced their understanding of the course material. Other students would respond and instructor could grade both entries.
Political Science: Select pairs for the semester. Each week partners will alternate finding articles on current political events. Students will then alternate role of writer and responder. They will explain and elaborate on article using language and theories of political science.

Online:
1. Form pairs at the beginning of the semester.
2. Create a private forum for each pair.
3. The writer will send their journal entry to their partner as an e-mail attachment.
4. Responder will add comments, suggestions, and questions in a different font, color, or in capital letters.
5. Entry will then be submitted to instructor for assessment and evaluation.
Purpose:
Responding to a prompt by writing one or two words or phrases encourages students to comprehend, analyze, and condense key components of a reading assignment or lecture. This technique requires equal participation among group members and allows students to consider the viewpoints and ideas of their group members.

Instructor:
1. Develop some prompts that will encourage comments.
2. Write the prompts on the top of a sheet of paper. These will be distributed to the groups and students will write their comments on the blank portion of the page.

Steps:
1. Place students in groups of four.
2. Distribute the pages with the prompts.
3. Give students a time allotment for completion or that when all students have participated, the activity is over.
4. Select student that will begin. The entry will be passed to each member in a clockwise rotation with each student writing words, sentences or phrases.
5. Explain that the first student will write as rapidly as possible and then read the response to the group. That will allow other group members time to think about their response.
6. The paper will be passed to the next student, who follows the same steps.... (write response and then read prompt and the previous response and their response aloud).
7. Have one group member read prompt and all responses aloud to class.

Disciplines:
Macro Economics: Reserve the last 15 minutes of a class for Round Table. Place students in groups of four. Have students to respond to Write down the muddiest point or the questions you still have regarding the determination of national income and employment. Collect the papers. Then determine the points that students find difficult and those that still confuse the students.

Online:
1. Ask groups to generate responses in threaded discussions in such a way that each member posts one comment until each student has posted. The value of the Round Table is that each student may post only once allowing everyone a posting.
DYADIC ESSAYS
Collaborative Writing Technique
adapted from Barkley, Cross and Major

Purpose:
Allows students to identify the main topics of a lecture and ask and answer questions on that material. Encourages the writing and answering of essay questions.

Instructor:
1. Develop instructions for teaching students how to write a good essay question.
2. Write a hand-out with guidelines and sample questions and answers. This provides students with an example of the level of complexity that you require.

Steps:
1. Discuss the components of a good essay question and answer. You may want to have the entire class work with you as you write an essay question and answer on the board or overhead. Then distribute the hand-out on essay questions that you developed.
2. Assign students to write an essay question over a lecture or assignment for homework.
3. Students will answer their essay question on a second sheet of paper.
4. They will bring these to class.
5. Place students in pairs. The pairs will exchange essay questions and write a response.
6. Students will then trade answers and discuss their responses.

Disciplines:
Biology: On major topic areas have students write an essay question and answer. A suggested topic could be "Describe the structure of the two basic cells categories and explain how the categories are similar and different." Allow thirty minutes per week of class time for students to exchange questions and use their texts and notes to answer the questions and then to respond. Students should then submit their questions and answers to you for a grade. You may find some questions to be used on your exams.

English Literature: After watching a video of Maya Angelou read her work, "I Know Why the Caged Bird Sings", students can develop an essay question about the work and write a response. Have students exchange questions and write response in class the next day.

Online:
1. Place students in pairs.
2. Give a time frame for students to post a question. Their partner will respond.
3. Then original students who wrote question will write their response.
4. Students will discuss each response and provide comments and comparisons.


Purpose:
Allows students to develop their evaluation skills of poor and good writing to enhance their own writing skills. Also provides students an opportunity to improve their papers before submitting the paper for a grade.

Instructor:
1. You must develop a Peer Review Form that lists the elements that students need to be looking for when critiquing writings.
2. You will need to discuss with students the elements and other factors that they need to be aware of when making constructive editorial comments.

Steps:
1. Place students with a partner.
2. Partners will take turns discussing their ideas for their paper. The partner listening will take notes and asks questions and make suggestions.
3. Each student will research material for their paper, but will be responsive to material for partner’s paper.
4. Students write their own papers individually.
5. Students will exchange their completed first draft with their partner. Partners will write comments and critiques on the paper and rate the paper with a Peer Review Form.
6. Students will correct and rewrite their own paper.
7. Students will attach the Peer Review Form to their final draft and submit for grading.

Disciplines:
Philosophy: Instructor asked students “What is the difference between appearance and reality?”. Student partners were told to discuss and then each select a philosopher they had studied in class on how that philosopher had approached that topic. Students were given time in class to exchange papers and edit each other’s papers.

Online:
1. Students can e-mail their papers to their partner.
2. Partners can e-mail back their comments and critique using Peer Review Form
3. Final papers can be submitted to you with the Peer Review Form as an attachment
COLLABORATIVE WRITING
Collaborative Writing Technique
adapted from Barkley, Cross and Major

Purpose:
Collaborative writing teaches students the steps of the writing process. This technique also teaches students the methods of collaborative writing which prepares them for a process they will use in their careers.

Instructor:
1. Determine how to break the writing assignment into chunks with interim due dates.
2. It is important to explain each step and require a completion of that step before proceeding to the next step. Remember: This is a method of teaching the steps in the writing process. This is an excellent activity for development classes and for freshman level courses.

Steps:
1. Place students in pairs
2. Pairs will discuss and brainstorm ideas (Require ideas to be submitted)
3. Students will research (Require an assignment)
4. Students will develop an outline (Require completed outline to be submitted)
5. Students may divide up sections of the outline for each student to write initial drafts.
6. Students will combine sections for first draft. Draft will be submitted.
7. Pairs will revise and edit their work and complete final paper.
8. Final paper will be submitted for grade

Disciplines:
Excellent writing process for all courses.

Online:
1. Place students with a partner.
2. Students can e-mail, phone or meet in person to work on paper.
3. Same steps as above can be followed.
Purpose:
Allows students to research topics without writing a formal research paper. Students will annotate, prepare, and print an anthology of course-related materials.

Instructor:
1. Provide examples of materials that you feel students need to review.
2. Develop requirements for assignment such as due dates, types of material to be provided, and methods of documentation for bibliographies.

Steps:
1. Place students in groups of four.
2. Guide the groups to determine a topic for research.
3. Each group member will research and select five to ten important resources on their topic. Each member will write a bibliography.
4. Group members will compile bibliographies and determine relevancy and currency of each entry aiming for a composite of eight to twelve citations.
5. Groups will divide into pairs and each pair will be assigned half the bibliography.
6. Pairs will divide with each student receiving half.
7. Each student will photocopy and write a brief reflective commentary on each source.
8. Then the pairs will exchange, read, review and develop a composite annotation for the sources.
9. The entire group will join together to prepare their work for final submission. They will write the introduction (with a statement of purpose and the anthology’s value to the intended audience), and the conclusion (with suggested applications of the anthology, unanswered questions, and suggestions for future research).
10. Completed anthologies will be submitted to the instructor.

Disciplines:
Education: Teams of students are asked to develop a bibliography of writings on multicultural education. Students are asked to develop a bibliography of relevant writings, photocopy select writings for inclusion in the anthology, and respond to the writers’ main points. The teams present their anthologies to the class.

Online:
1. Students can use a designated discussion area and e-mail to communicate with each other in creating bibliography.
2. Students may generate a “hard copy” anthology, but may also create the anthologies as PDFs (Portable Document Files) that can be posted online.
PAPER SEMINAR
Collaborative Writing Technique
adapted from Barkley, Cross, and Major

Purpose:
Provides a framework for students to discuss, interpret, and analyze using the knowledge gained from their own research and readings. Provides students with feedback of their work.

Instructor:
1. Decide on timelines for students to prepare and conduct seminar.
2. Provide guidance on how to read a paper critically and prepare a response.
3. Create a form listing the roles of the presenter, respondent and group members.
   Presenter: write the paper, distribute copies to group members, and organize comments for a five to ten minute verbal summary
   Respondent: read the paper, take notes, and formulate questions for the group to discuss.
   Group Member: read the paper, marking the text for interesting passages, and jotting down questions and comments for the discussion.

Steps:
1. Place students in groups. Tell students that all will be responding formally and informally to peers’ papers.
2. Within the groups, pair the members. One member will be a presenter and another will be the responder for that person and reverse.
3. Explain time frame and tasks.
4. Students will present papers to their group members (5 to 10 minutes)
5. Respondents will respond (5 to 10 minutes)
6. Give groups 10 to 20 minutes to discuss the paper.
7. Follow the same sequence for the second presenters and so forth.

Disciplines:
World Geography: To synthesize the concept of how the physical, cultural, and economic features of a country relate to the quality of life, assign students to write a paper where they as a leader of a small tropical island must implement policies that enhance life for the entire island. Have students relate their decisions to course concepts and theories.
Marketing: Students are grouped according to a particular product that they wish to market. Each group will research the advantages and disadvantages of online distribution for their product.

Online:
1. Place students with a partner and have them e-mail papers to each other. Responses can be e-mailed with final paper and responses sent to instructor.
**Other Resources:**

**Strategies for Inclusive Teaching: Fostering Equitable Class Participation**  
(Center for Instructional Development and Research, University of Washington)  
http://depts.washington.edu/cidrweb/inclusive/foster.html

**Suggestions for a Course Syllabus and/or Requirement Sheet for University Instructors and Professors**  
(University Ombudsman, University of Kansas)  
http://www.ku.edu/~ombuds/suggest.html

**Grading Class Participation**  
(Martha L. Maznevski, Assistant Professor, McIntire School of Commerce, University of Virginia)  

**Student Participation Rubric**  
(Professor Kathleen Tunney, Dept. of Social Work, SIUE)  
http://www.siu.edu/~deder/partrub.html

**Guidelines for Class Participation**  
(Dr. Donald J. Raux, Siena College)  
http://www.siena.edu/raux/Class%20Participation%20Guidelines.html

**Learning-Centered Syllabi Workshop (Iowa State University)**  
Material prepared by Lee Haugen  
http://www.cte.iastate.edu/tips/syllabi.html

**Summary of "Creating a Learning Centered Syllabi"**  
by Ken Jones, College of Saint Benedict | Saint John's University  
http://www.csbsju.edu/les/pastevents/syllabi.htm

**Scholarly Reflections About Teaching**  
Excerpt from 1994 Peer Review of Teaching Workshop by Lee Shulman and Pat Hutchings sponsored by AAHE.  

**The State of the Syllabi at Drexel University**  
http://www.drexel.edu/irt/facilities/fdc/syllabistate.html

**Books**  
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