



**The Center for Excellence in Science Education:** <http://cese.science.psu.edu/>

The Center for Excellence in Science Education (CESE) is a teaching and learning center in the Eberly College of Science with the mission to facilitate and advance nationally recognized excellence in education within the College. CESE provides faculty members with high-impact, research-based pedagogical materials, and students with educational opportunities designed to promote learning and instructional excellence. CESE also advocates for cultural change within Penn State University to acknowledge the co-dependent importance of driving excellence in research and education through scientific advances.

This digital instructor guide was created to provide faculty with a quick reference to essential resources for teaching. It is organized around the construction of a course syllabus. A course syllabus communicates sets the tone for a course by providing the vital information of what when and how students will learn as well as how the instructional team will support students in this effort. It also sets the stage for the assessment of learning. Clear communication of the expectations of the students and the instructional team through course policies as well as learning goals provides everyone in the course with the clear message that we are in this experience together. The suggested syllabus content that is outlined in this handbook aligns with research-based practices for learning. As each section of the syllabus is discussed, we will share resources for content. We will also provide additional resources for promoting student learning at the end of this handbook.

A syllabus is a roadmap that students follow in order to be successful in a course. Knowing the required content of a syllabus is extremely important it is important to start with a checklist for your syllabus that encompasses all the required as well as highly recommended sections.

## SYLLABUS CONTENT

Faculty Senate [Policy 43-00](http://senate.psu.edu/policies-and-rules-for-undergraduate-students/43-00-syllabus/) <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/43-00-syllabus/> **requires** that a written (paper or electronic form) syllabus must be distributed to students in each course on or before the first class meeting, and the syllabus must remain available to students electronically until the end of the semester. Although not required, a syllabus “subject to change statement” is recommended. A thorough syllabus should contain the following items:

### Basic Course Information

#### Course Information

- Course Id, Name, Number/Section
- Prerequisites (*courses, skills, experience*)
- Class Location(s) and Time(s)
- Lab Locations(s) and Time(s)
- Texts, Readings, Materials, Web Site(s) (*indicate what is required and optional*)

#### Instructor Information:

- Full Name
- Title
- Office Location
- Office Phone
- Office Hours and how to arrange a meeting at times not regularly scheduled
- Email Address
- Web site (*if available*)

*Comment:* It is important to include the basic information about your course on the first page of the syllabus. This should include the most important demographic information on your course: what is it, what are the prerequisite skills, where and when it will be held and the list of required and optional course materials. This provides students with a clear picture of whether or not they are in the right course and the resources they will need to acquire. Your contact information is absolutely essential because sharing this on the first page indicates that you expect to have contact with them both inside and outside of class time. The policy on office hours

as discussed in the *Penn State 2016-2017 Faculty Handbook*, pgs. 34-35 is discussed in the next paragraph.

### **Office Hours:**

*Penn State 2016-2017 Faculty Handbook*, pgs. 34-35.

Although there is no applicable Senate Policy, each department and campus has its own set of procedures for establishing office hours. Be sure to familiarize yourself with the policies and procedures for your unit or campus. List your office hours in the syllabus and announce them in class. Encourage students to see you if they need help or advice. You should have at least one office hour per week for each course that you teach. If you have several office hours each week, it is a good idea (and some units require) that you stagger them so that they are not all within the same class period, thereby reducing the possibility that a student will not be able to make your office hours because of a class conflict. You should also make yourself available by appointment and be willing to extend your office hours during times of stress for your students, particularly at the beginning and end of the semester and preceding and following exams.

Inform your students where your mailbox is located, and regularly check your mailbox and your email, if you have told your students that you are available via e-mail. Some instructors also set up e-mail hours, so that students know when you will be checking your messages for student queries. Email availability, however, is not a substitute for keeping regular office hours, which should be held on campus in your office.

### **Change in class meeting times:**

If you need to **reschedule class meeting times** *Faculty Senate Policy 34-83* states that the changes in class meeting times must be approved by the dean of the college or the chancellor. This information would then need to be communicated to the students and included in a new version of the course syllabus.

### **Course Goals and Objectives**

- Explicit statement(s) about intended outcomes (*Goals and Learning Objectives*) for the course.

*Comment:* The goals and objectives for existing courses being taught in ECoS have already been defined. Your Department course coordinators can help you find the current set of goals and objectives and your course. Your assessments and activities need to be aligned with the course goals and objectives. Resources to assist you in aligning course goals and learning objectives with assessments and activities can be found on the CESE and Schreyer Institute for Teaching Excellence websites:

<http://cese.science.psu.edu/>, <http://www.schreyerinstitute.psu.edu/>

Learning objectives take into account the situational factors that determine the level of the course as well as the number of credits. When teaching a course it is very important to balance the workload for students to the credit load of the course. The section below regarding workload is found in the Undergraduate Advising Handbook and in Faculty Senate policy 42-23.

### **Balancing credits with workload**

<https://handbook.psu.edu/content/credit-and-credit-load#ptload>,  
<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/42-00-acquisition-of-credit/#42-23>

The student handbook uses a rule of thumb 45 hours of work a week for a 15 credit course load. Most courses are 3 credits so that would translate to 8 hours a week per 3-credit course. For a 15-week Fall/Spring course, this workload means about 2 ½ hours per week in class and about 5 ½ hours per week outside of class. Faculty Senate Policy 42-23 states that a total of forty-five (45) hours of work planned and arranged by the University faculty is required to gain 1 credit. The distribution between class activities and outside preparation may vary from course to course. When teaching lecture, discussion, seminar or recitation courses, a typical distribution of time is approximately one-third instruction and two thirds outside preparation. When teaching laboratory courses, the distribution can vary between 25-40 hours of laboratory instruction per credit with sufficient additional outside preparation.

### **Methods for Learning and Teaching**

- Method(s) of course delivery (e.g., traditional lecture, Student Centered Discussion, on-line discussion etc.) are clearly described.
  
- Student responsibilities are described (e.g., student will need to use Canvas to post assignments, student will use First Class for discussion etc.).
  
- Make sure you emphasize all the forms of assistance and guidance students have to be successful in your course

*Comment:* Students benefit greatly when faculty are transparent about why they are teaching the course in a specific way. Clearly stating the pedagogical approach you have chosen to take and your expectations for students is extremely important. It is also important to be explicit about how you and your instructional team will provide resources to support student learning. If you or your Department also provides resources to assist in learning the material covered in your course, you need to share these important resources with students as well. PSU Learning, a multi-disciplinary academic assistance program supported by the University also has resources for large introductory level courses as well as other generalized learning support resources. <https://pennstatelearning.psu.edu/>

### Required Course Materials

- Briefly discuss how textbooks, packets etc. will be used in the course and where reserved materials if available will be located
- Location and full descriptions of any additional or optional materials is provided.

### Course Calendar and Schedule

- The calendar/schedule clearly illustrate the time and date requirements for topics, readings, assignments, exams, projects, special activities, etc.
- The drop/add dates for the semester. This information is found using the Academic Calendars tab on the Registrar's webpage.

*Comment:* The University Registrar's webpage has academic calendars for every semester that will assist you in sharing important deadlines with your students and also assist you in planning your course schedule.

[http://www.registrar.psu.edu/academic\\_calendar/calendar\\_index.cfm](http://www.registrar.psu.edu/academic_calendar/calendar_index.cfm)

### Course Requirements

- Required activities (e.g., assignments, projects, class attendance, in-class participation etc.) are clearly designated and described.
- When applicable, all required technology components are clearly described.

### Course Policies

Grading:

- Basis for grades, as detailed as possible
- Examination Policy
- Evening examination schedule, if necessary

- All components and weights are clear.
- Policies for missed projects/assignments are provided.
- Exam weights are clear.
- Policies for make-up quizzes and exams are addressed.
- When applicable, policies for extra credit is given are clear.

*Comment:* Faculty Senate Policies 44-10 – 44-50 are reviewed below. These policies are also stated in the Penn State Undergraduate Advising Handbook.

**Exams Policies,** <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/44-00-examinations/>  
<https://handbook.psu.edu/content/examinations>

- *Evening Exams-* can be scheduled for courses that do not usually meet in the evening. Evening exams are scheduled by the Registrar and are announced to students by the instructor the first week of classes.
- *Conflict Exams-* A student is permitted to make up a missed exam without penalty if he/she has a conflict between an exam/quiz and a scheduled University-approved activity or if he/she has more than one exam/quiz scheduled for the same time.
- *Final Exams-* Final exams must be scheduled during the final exam period. During the last week of classes no comprehensive exams may be scheduled; only quizzes or narrowly limited tests worth no more than 10% of a student's grade may be given. If a take-home exam or final project, or term paper is given in lieu of a final exam, then the due date cannot be earlier than the first day of the final exam period. Some exceptions to this policy have existed in ECoS and one of those is for laboratory courses where final exams are often given during the last laboratory meeting. Final exam periods are a maximum of 110 minutes long and the Registrar's Office determines the final exam schedule and arranges for conflict exams,  
<https://handbook.psu.edu/content/examinations>
- <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/44-00-examinations/#44-20>

**Attendance:**

- If class attendance is required, the policy for missed classes is clear.
- Any policy regarding lateness is clear.

*Comment:* Faculty Senate policies governing class attendance are reviewed in the next two sections.

### **Class Attendance**

<https://handbook.psu.edu/content/class-attendance>, Faculty Senate Policy 42-27, <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/42-00-acquisition-of-credit/#42-27>

Students are responsible for attending class and the work covered in class. At the discretion of the instructor, the student's grade may be lowered because of class absence. University-approved curricular and extracurricular activities would include: Martin Luther King Day of Service, field trips, debate trips, choir trips, and athletic contests. Attendance expectations must be clearly stated in the course syllabus.

### **Religious Observances**

<http://undergrad.psu.edu/aappm/R-4-religious-observances.html>

It may not be practical or possible to avoid all calendar conflicts with religious observances. When conflicts do arise, reasonable accommodations should be made that promote both the University's respect for a more inclusive, civil, and diverse learning community and the integrity of the student and faculty commitment to learning. Every attempt should be made to avoid placing these two goals into conflict. The link to the holy day calendar, <http://www.events.psu.edu/cgi-bin/cal/webevent.cgi?cmd=listyear&ncmd=startup&cal=cal42>

- Lab Policies
- ECoS Code of Mutual Respect and Cooperation (suggested language: [science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation](http://science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation))

*Comment:* **The Code of Mutual Respect and Cooperation** was developed to embody the values that the Eberly College of Science hopes their faculty, staff, and students possess, consistent with the aspirational goals expressed in the Penn State Principles. The link to comments for instructors that can be added directly to your syllabus is: <https://science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation/Comments%20for%20instructors.pdf>

### **The 12 Principles of the Code are:**

1. Treat everyone equally and with respect
2. Be courteous
3. Be ready to communicate
4. Encourage others and share your expertise with them
5. Give and accept constructive criticism
6. Be receptive to change

7. Be a team player
8. Get involved
9. Have a positive attitude
10. Be honest and accept responsibility
11. Recognize other people's priorities
12. Strive to do your best

### Academic Integrity Considerations

- Make sure the students understand the importance of academic integrity
- Make sure your students know you are committed to academic integrity
- Make sure your students know what is constituted as cheating
- Make sure the language you use when addressing academic integrity does not contradict University or ECoS policy/procedures,  
<https://handbook.psu.edu/content/syllabus>,  
<http://science.psu.edu/current-students/Integrity/Syllabi.html>
- Make sure you are clear on the rights and responsibilities guiding how you will respond to cheating

*Comments:* A review of the University academic integrity policies are below along with the links to these policies. ECoS also has a statement regarding academic integrity that should be added to your syllabus (see above).

<https://handbook.psu.edu/content/academic-integrity>

<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/47-00-48-00-and-49-00-grades/#49-20>

### Academic Integrity

<http://science.psu.edu/current-students/Integrity/Policy.html>

Definition and expectations: Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle.

Additional link to a tutorial that can be used to inform students about integrity, plagiarism, and copyright: <http://tutorials.istudy.psu.edu/academicintegrity/>



**Faculty Senate Requirements With Links to Recommended Statements:**

<http://senate.psu.edu/faculty/syllabus-statement-examples/>

*Comments:* Faculty Senate has suggested syllabus statements for required sections. The links to these statements are below.

The Faculty Senate **requires** that the syllabus contain:

- Academic Integrity Statement. (link and suggested language: see link above and also ECoS link here <http://science.psu.edu/current-students/Integrity/Syllabi.html> )
- Disability Statement: The Commonwealth College has a disability statement developed for inclusion. (suggested language: see link above)
- Link and Statement for Report Bias: (suggested language: see link above)
- Link and Statement for Mental Health Services: (suggested language: see link above)

***Please note that faculty may make adjustments to syllabi, but these must be provided to all students in writing (paper or electronic form).***

The next three pages (10-12) contain the ECoS Syllabus Checklist that can be printed and used to make sure you have all the required and suggested sections of your syllabus.

## ECoS CHECKLIST FOR SYLLABUS CONTENT

Faculty Senate [Policy 43-00](http://senate.psu.edu/policies-and-rules-for-undergraduate-students/43-00-syllabus/) <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/43-00-syllabus/> **requires** that a written (paper or electronic form) syllabus must be distributed to students in each course on or before the first class meeting, and the syllabus must remain available to students electronically until the end of the semester. Although not required, a syllabus “subject to change statement” is recommended. A thorough syllabus should contain the following items:

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### Course Goals and Objectives

- Explicit statement(s) about intended outcomes (*Goals and Learning Objectives*) for the course.

### Methods for Learning and Teaching

- Method(s) of course delivery (e.g., traditional lecture, Student Centered Discussion, on-line discussion etc.) are clearly described.
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#### Attendance:

- If class attendance is required, the policy for missed classes is clear.
- Any policy regarding lateness is clear.

#### Miscellaneous Policies:

- Lab Policies
- ECoS Code of Mutual Respect and Cooperation (suggested language: [science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation](http://science.psu.edu/climate/support-and-resources/code-of-mutual-respect-and-cooperation))

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## Links to Teaching and Learning Support Units at PSU

**The Center for Excellence in Science Education:**

<http://cese.science.psu.edu/>

**The Office of Digital Learning:**

<http://odl.science.psu.edu>

Part of the Eberly College of Science, this office helps faculty and students make the most of digital learning technologies as well as supports the World Campus portfolio. They collaboratively design and build tools for any pedagogy. Dream it and they can help you build it. The office offers learning design support, multimedia resources, and research and assessment strategies. The director, Melissa Hicks, can be reached at [mjs100@psu.edu](mailto:mjs100@psu.edu).

**The Schreyer Institute for Teaching Excellence**

<http://www.schreyerinstitute.psu.edu/>

*The mission of the Schreyer Institute is to advance and inspire excellence in Penn State's teaching and learning community.* This is the University teaching and learning center and they provide a variety of services including: consultations, classroom observations, workshops, testing and scanning services, and grants.

**Leonhard Center**

<http://www.engr.psu.edu/leonhardcenter/index.html>

Resources for teaching written and oral communication skills in STEM

<http://www.engr.psu.edu/leonhardcenter/engineeringcommunications/>

## PSU Academic Resources

**Penn State Undergraduate Education**

[http://undergrad.psu.edu/faculty\\_and\\_staff.html](http://undergrad.psu.edu/faculty_and_staff.html)

**Penn State Faculty Handbook, 2016-2017**

<http://provost.psu.edu/wp-content/uploads/sites/36122/2016/07/2016-17-Penn-State-Faculty-Handbook-Updated-July-2016.pdf>

**Academic calendars**

[http://registrar.psu.edu/academic\\_calendar/calendar\\_index.cfm](http://registrar.psu.edu/academic_calendar/calendar_index.cfm)

When planning any course it is essential to have a copy of the academic calendar for the semester you will be teaching. The information contained on these calendars

includes key dates and deadlines for the semester. The ECoS Syllabus Check Sheet (see below) will prompt you to insert important dates into syllabus as a guide for you and your students.

### Confidentiality of Student Records

*Penn State 2016-2017 Faculty Handbook, pg 36.*

Educational records are kept by University offices to facilitate the educational development of students. Faculty and staff members may also keep informal records relating to their functional responsibilities with individual students.

The Federal Family Educational Rights and Privacy Act (FERPA) of 1974 identifies the rights of students and their families with respect to student educational records kept by institutions. As part of the requirements of FERPA, the University has a Policy on Confidentiality of Student Records (University Policy AD11).

Information from records, files, and data directly related to a student may not be disclosed by any means (including telephone) to individuals or agencies outside the University (including parents) without the prior written consent of the student.

Information contained in such records may be shared within the University with "university officials" having "legitimate educational interest" in such information. It is important for instructors to protect student confidentiality when listing class exam grades, returning class papers or projects, and writing letters of recommendation.

**For more information, please refer to the Confidentiality/FERPA page on the Registrar's website and read the *Faculty and FERPA* brochure. If you have questions, please contact the Registrar's Office in 112 Shields Building at 814-865-6357.**

### Student Rating of Teaching Effectiveness (SRTEs)

<http://www.sрте.psu.edu/>

The Student Rating of Teaching Effectiveness (SRTEs) are Penn State's locally developed instrument for gathering feedback from students at the end of the term. The SRTEs were approved by the University Faculty Senate in 1985 and are administered by the Office of the Vice Provost of Academic Affairs. **NOTE:** If you are teaching a course for the first time in an experimental way, an administrator and faculty member might agree not to include SRTE results in a tenure or promotion dossier. Such agreements should be in writing. This is an important point, because we do not want the SRTE process to impede faculty from well-planned experimentation in the classroom.

[https://www.sрте.psu.edu/Faculty\\_admin\\_forms/](https://www.sрте.psu.edu/Faculty_admin_forms/)

### **Student Disability Resources**

<http://equity.psu.edu/student-disability-resources>

<http://equity.psu.edu/student-disability-resources/faculty-handbook/syllabus-statement>

Student Disability Resources (SDR) Office is the designated unit that provides reasonable accommodations and services to students with disabilities who are enrolled at the University Park location

### **Student Early Indicators and Progress Reports (EPR)**

<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/47-00-48-00-and-49-00-grades/#47-70>

<https://sites.psu.edu/starfishinfo/user-roles/instructors/early-progress-reports/>

A system designed to assist in communicating academic performance early in the semester to students and their advisers. Faculty will now have the opportunity to complete two progress surveys — an Early Indicators Reporting period in the third week of classes and a Mid-semester Progress survey in the seventh week. Unlike the Mid-semester Progress survey, the Early Indicators survey does not need to be based on graded work. The earlier students are alerted to potential academic concerns, the more opportunity they have to develop strategies for academic success.

In the second week of the semester faculty who are teaching first year students will receive an email announcing the Early Indicators Survey. The University is using STARFISH ( <http://sites.psu.edu/starfishinfo/> ) to deliver the Early Indicators and Progress Reports. Starfish® Enterprise Success Platform™ by [Hobsons](#) is the suite of academic advising tools selected by Penn State to integrate with LionPATH and replace ISIS and eLion advising features that currently deliver advising notes, early progress reports (EPRs), and online scheduling of advising appointments. You have a Starfish point person in your Department who can help to acclimate you to the system. Also the link above to Starfish will walk you through tutorials.

### **Behavioral Threat Management**

<http://btmt.psu.edu/>

The Behavioral Threat Management unit provides education, communication, planning, assessment, and management toward the goal of mitigating behavioral threats. Safety on our campuses and in our communities is everyone's responsibility. By recognizing and reporting behavior you believe to be a potential concern, you can help our community members get the assistance and services they might need.

## Links to Instructor Tools at PSU

### PSU Course Management System

<http://canvas.psu.edu/>

Penn State is in the process of converting all of our courses to CANVAS as our course management system. Within ECoS, there are still a number courses using our old management system (ANGEL), but everyone will be converted to CANVAS by December 2017 when the support for the old system goes away.

### Teaching and Learning with Technology

<http://tlt.psu.edu/about/about-tlt/>

Collaborates with faculty, instructional designers, and students to promote creative and innovative uses of technology to enrich teaching and learning at Penn State. They provide services for many of the core technologies that drive our classrooms, labs, and other learning environments.

### Classroom and Lab Computing

<http://clc.its.psu.edu/classrooms>

This subgroup of TLT equips and supports the General-purpose Technology Classrooms at the University Park Campus. They support the PSU classroom communication system, iclicker, and also Doceri. Many faculty across ECoS utilize these technologies in their classrooms.



## Popular Technologies Used by ECoS Faculty

### Classroom Communication System

i>clicker, <http://www.clickers.psu.edu/> i>clickers are used at Penn State. The link provided will take you to i>clicker homepage for PSU and there are links for students, instructors, and training support. A good contact in CLC for i>clicker is Dave Test, [dmt238@psu.edu](mailto:dmt238@psu.edu).

### Penn State Supported Technologies

- **Sites**

<http://sites.psu.edu>

Blogging platform powered by Wordpress that allows for the creation of personal expression via web.

- **Voicethread**

<http://voicethread.psu.edu>

VoiceThread is a totally web-based application that allows you to place collections of media like images, videos, documents, and presentations at the center of an asynchronous conversation. A VoiceThread allows people to have conversations and to make comments using any mix of text, a microphone, a web cam, a telephone, or uploaded audio file.

- **Zoom**

<https://psu.zoom.us/>

Zoom video conferencing allows you to engage in multi-person video or audio meetings using software installed on your computer, without the need for dedicated video conferencing hardware. Zoom combines cloud video conferencing, simple online meetings, group messaging, and a software-defined conference room solution into one easy-to-use platform.

- **Adobe Connect (contract ends August 2018)**

<http://meeting.psu.edu>

Meeting at PennState, powered by the Adobe Connect Meeting module, is an enterprise web conferencing solution for online meetings, e-Learning, and webinars. It is based on Adobe Flash technology, so you can deliver rich interactions that participants can join easily with a Penn State Access Account, a Friends of Penn State (FPS) Account, or a Guest account.

- **Doceri**

<http://doceri.psu.edu/>

An application that can be used with any Windows or Macintosh computer, to control the computer with an iPad. With Doceri, you can launch any document or application, annotate over them, and save the annotations.

There is also a whiteboard feature, where you can create any handwritten/drawn content on any background of your choice. Penn State ITS has licensed and installed Doceri Desktop on all technology classroom podium computers, and all Windows podium PCs and Macs that participate in [Cooperative Lab Management \(CLM\)](#).

## **PSU Resources to Support Teaching and Learning**

### **Penn State iStudy for Success modules**

<http://istudy.psu.edu/>

The iStudy tutorials are designed to advance students' knowledge and skills in areas that can promote overall academic achievement, such as studying, communicating, and career planning.

### **Penn State Learning**

<https://pennstatelearning.psu.edu/>

Enriches the academic experiences of undergraduates and augments the work of faculty and advisers. Penn State Learning prepares peer tutors and supports them as they lead diverse co-curricular learning communities that promote disciplinary knowledge and skills, as well as successful habits of life-long learners. Our staff and tutors partner with faculty to communicate learning objectives, test methods for helping students achieve those objectives, provide departments feedback for measurement and refinement, and, as appropriate, present conclusions to peers for review.

### **World Campus Faculty Development**

<http://wcf.d.psu.edu/>

Faculty Development for Outreach and Online Education supports online faculty at key stages of their careers in order to positively impact student success. When our faculty succeed we know that our students benefit from the best Penn State has to offer. Please check out our services and let us know how we can assist you or your program in preparing for teaching success.

## Additional Resources to Support Teaching and Learning

### Lynda.com

<http://lynda.psu.edu>

Free video tutorials on Illustrator, Dreamweaver, Photoshop, Access, Excel, PowerPoint, and more educational technologies and learning tools—all free to Penn State faculty, staff, and currently enrolled students

### Tips for New Professors/First Day of Class

<https://www.insidehighered.com/advice/2010/05/28/lessons-new-professors>

<https://teachingcenter.wustl.edu/resources/course-design/tips-for-faculty-teaching-for-the-first-time/>

<https://teachingblog.mcgill.ca/2014/03/21/learning-to-teach-10-tips-for-professors/>

<http://www.theyearoflivingsabbatically.com/the-first-day-of-class-20-quick-and-dirty-tips-for-professors>

### "Teach Students How to Learn: Strategies You Can Incorporate Into Any Course to Improve Student Metacognition, Study Skills, and Motivation", Saundra Yancy

McGuire with Stephanie McGuire, 2015, ISBN-13: 978-1620363164

Also available online through the PSU University Library

This book encapsulates the model and ideas she has developed in the past fifteen years, ideas that are being adopted by an increasing number of faculty with considerable effect.

### Carl Wieman Science Education Initiative at the University of British Columbia

[http://www.cwsei.ubc.ca/resources/instructor\\_guidance.htm](http://www.cwsei.ubc.ca/resources/instructor_guidance.htm)

The Carl Wieman Science Education Initiative (CWSEI) is a multi-year project at The University of British Columbia aimed at dramatically improving undergraduate science education. This website has numerous resources for STEM educators including a series of videos demonstrating the use of active learning teaching strategies. <http://blogs.ubc.ca/wpvc/>

Links to- <http://www.cwsei.ubc.ca/resources/index.html>

Assessments that support student learning, clicker resource guide, strategies for the first day of class, group work in educational settings, teaching expert thinking, succeeding at learning and many more..

### Stephen Chew Videos Series

Stephen L. Chew is a professor and chair of psychology at Samford University in Birmingham, Alabama. He is a cognitive psychologist, and one of his primary

research areas is the cognitive basis of effective teaching and learning. His research interests include the use of examples in teaching, the impact of cognitive load on learning, and the tenacious misconceptions that students bring with them into the classroom. He is best known as the creator of a groundbreaking series of YouTube videos for students on how to study effectively in college based on cognitive research ([www.samford.edu/how-to-study](http://www.samford.edu/how-to-study)). The videos have received over a million views and are in use at educational institutions worldwide. He has recently created a series of videos for faculty as well to introduce them to the cognitive science of learning. Links for both series are below:

- *Student Series-*  
<http://www.samford.edu/departments/academic-success-center/how-to-study>
- *Faculty Series-*  
<http://www.samford.edu/employee/faculty/cognitive-principles-of-effective-teaching>
- Teaching Understanding  
[https://www.youtube.com/watch?v=SfloUd3eO\\_M](https://www.youtube.com/watch?v=SfloUd3eO_M)  
<https://www.youtube.com/watch?v=ggThtInFtnM>
- Tips for writing good multiple choice questions:  
<https://testing.byu.edu/handbooks/14%20Rules%20for%20Writing%20Multiple-Choice%20Questions.pdf>

### **Classroom Assessment Techniques (CATs)**

formative assessment strategies to use in class

Description of formative assessment:

[https://www.schreyerinstitute.psu.edu/pdf/Classroom\\_Assessment\\_Techniques\\_Intro.pdf](https://www.schreyerinstitute.psu.edu/pdf/Classroom_Assessment_Techniques_Intro.pdf)

Links to Examples: <https://cft.vanderbilt.edu/guides-sub-pages/cats/>

### **Student Assessment of their Learning Gains (SALG)**

For getting formative feedback from your students about how your class is going

Description of SALG

website: <http://www.flaguide.org/extra/download/cat/salg/salg.pdf>

Direct link to SALG website: <http://salgsite.org/>

Classroom Assessment Techniques: <https://cft.vanderbilt.edu/guides-sub-pages/cats/>

Student Assessment of their Learning Gains: <http://salgsite.org/>

Tips for writing good multiple choice questions:

<https://testing.byu.edu/handbooks/14%20Rules%20for%20Writing%20Multiple-Choice%20Questions.pdf>

Writing multiple choice questions for higher level thinking:

<http://www.learningsolutionsmag.com/articles/804/writing-multiple-choice-questions-for-higher-level-thinking>

## References on How People Learn

“How Learning Works”, by Susan Ambrose, Michael Bridges, Michele DiPietro, Marie Norman, Wiles, 2010, eISBN 9780470617595, available online through the PSU University Library,

<http://www.pensu.ebib.com.ezaccess.libraries.psu.edu/patron/FullRecord.aspx?p=529947&echo=1&userid=d0TKyJMEEhk%3d&tstamp=1470861210&id=0375D7A519FA54F7462DE61268A626D460D36467>

“How People Learn: Brain, Mind, Experience, and School: Expanded Edition (2000), free download from: <http://www.nap.edu/>

“Teach Students How to Learn: Strategies You Can Incorporate Into Any Course to Improve Student Metacognition, Study Skills, and Motivation”, Saundra Yancy McGuire with Stephanie McGuire, 2015, ISBN-13: [978-1620363164](https://www.amazon.com/dp/9781620363164)

Also available online through the PSU University Library

This book encapsulates the model and ideas she has developed in the past fifteen years, ideas that are being adopted by an increasing number of faculty with considerable effect.

“Reaching Students: What Research Says About Effective Instruction in Undergraduate Science and Engineering” (2015), free download from <http://www.nap.edu/>

## ECoS Faculty Network

### ECoS Undergraduate Program Coordinators

The list of faculty below teach courses and coordinate the undergraduate programs for their Departments. They know the types of courses taught, the learning

objectives for the courses in their Department as well as the technologies and strategies used by their colleagues. They are a great source of information.

Astronomy- Chris Palma, [cxp137@psu.edu](mailto:cxp137@psu.edu)

Biology- Carla Hass, [cah19@psu.edu](mailto:cah19@psu.edu) , John Waters, [jrw8@psu.edu](mailto:jrw8@psu.edu)

Biochemistry and Molecular Biology- Meredith Defelice, [mrd22@psu.edu](mailto:mrd22@psu.edu)

Chemistry- Mark Maroncelli, [mxm11@psu.edu](mailto:mxm11@psu.edu)

Math- James Sellers, [jxs23@psu.edu](mailto:jxs23@psu.edu)

Physics- Rick Robinett, [rq9@psu.edu](mailto:rq9@psu.edu)

Statistics- Matthew Beckman, [mdb268@psu.edu](mailto:mdb268@psu.edu)

## Teaching Practices in ECoS

Below is a list of faculty members that use various teaching practices that you may wish to observe and adopt in your courses. Faculty contact information, teaching approaches, and other relevant information are listed below for each course. We advise anyone who would like to see these practices to contact the faculty member to provide great times and locations to see these dedicated and talented ECoS educators in action.

### **Julia Kregenow ([jmk50@psu.edu](mailto:jmk50@psu.edu))**

Astronomy 006

GN course for non-science majors

Approaches: color voting cards (low-tech for clickers), in-class worksheets done in small groups, drawing names randomly from hat to get democratic random sampling of participation, occasional minute papers, think-pair-share small group discussions in class, lots of images and animations shown in lecture.

### **Jennelle Malcos ([jlh608@psu.edu](mailto:jlh608@psu.edu))**

BIOL141 - Introductory Physiology (700 students)

BIOL129 - Mammalian Anatomy (350 Students)

Approaches: "I use clickers and interactive worksheets with the help of 15 Learning Assistants. Worksheets are not every class, so if that is a major goal, faculty can email me and I can give them dates of worksheets coming up."

### **John Waters ([jrw8@psu.edu](mailto:jrw8@psu.edu))**

BIOL 240 - Function and Development of Plants and Animals (~600 students)

Approaches: "I use interactive activities (no clickers, but discussion questions and worksheets) with the help of 14 Learning Assistants (LAs). I don't have an LA led

activity in every class, so if that is a major goal, faculty can email me and I can give them dates to come by week by week.”

**Stephen Van Hook ([sv11@psu.edu](mailto:sv11@psu.edu))**

PHYS 212 (large lecture introductory course)

Approaches: clickers with peer discussion and LAs

**Kate Masters ([kmm14@psu.edu](mailto:kmm14@psu.edu))**

Chem 202, Chem 432

Approaches: Group activities and LAs

**Jim Hager ([jah14@psu.edu](mailto:jah14@psu.edu))**

Math 110 - Calculus

MWF, 11:15-12:05 (121 Sparks), 12:20-1:10 (10 Sparks)

Approaches: Doceri, A Little Calculus, Clickers, WebAssign

**David Zach ([dkz105@psu.edu](mailto:dkz105@psu.edu))**

Math 34 - Mathematics of Money

Approaches: Doceri, Clickers

**Cheryl Hile ([cvh11@psu.edu](mailto:cvh11@psu.edu))**

Math 220 - Linear Algebra

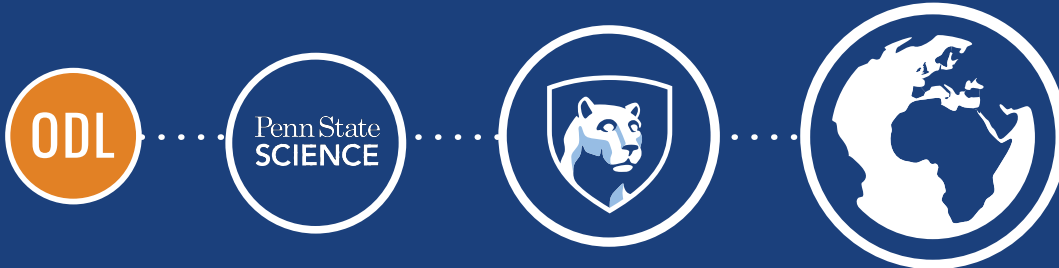
Approaches: Doceri, Clickers

**David Little ([dlittle@math.psu.edu](mailto:dlittle@math.psu.edu))**

Math 141

Approaches: Clickers, A Little Calculus





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initiative [website](#)

## Disciplinary Resources

### *Physics:*

**PhysPort.org** (formerly known as the PER User's Guide), the go-to place for physics faculty to find resources based on physics education research (PER) to support your teaching. <https://www.physport.org/>

In addition to other valuable resources you will find a comprehensive article on active learning by Stephanie Chasteen, University of Colorado Boulder on this website. "How do I help students engage productively in active learning classrooms?" posted June 20, 2017 and revised July 14, 2017, <https://www.physport.org/recommendations/Entry.cfm?ID=101163>

### *Statistics:*

**CAUSE:** Consortium for the Advancement of Undergraduate Statistics Education. A national organization whose mission is to support the advancement of undergraduate statistics education. <https://www.causeweb.org/cause/>

### *Life Sciences:*

**PULSE:** Partnership for Undergraduate Life Sciences Education  
The Partnership for Undergraduate Life Sciences Education incorporated as a non-profit, 501c3 organization in April, 2016. PULSE originated in October, 2012 as an initiative launched by a group of program officers from the National Science Foundation (NSF), the Howard Hughes Medical Institute (HHMI), and the National Institute for General Medical Sciences (NIGMS/NIH). This steering committee\* convened a meeting of 40 Vision and Change Leadership Fellows that had demonstrated experience as change agents at Associate's, Baccalaureate, Master's and Doctoral/research universities. <http://www.pulsecommunity.org/page/resources>

### *Chemistry:*

Learning Chemistry Enhancing Learning and Teaching: Royal Society of Chemistry <http://www.rsc.org/learn-chemistry/#!>

ACS

<https://www.acs.org/content/acs/en/education/resources/undergraduate.html>