**Course Description**

Most children entering first grade do not know how to read; most children leaving first grade do know how to read, at least at a basic level. Further development of reading skills continues throughout the school years. What is involved in the amazing development of the ability to make meaning of marks on a page? What goes on in the brain during reading and learning to read? What might be happening (or not happening) in the behaviors and brains of children who have difficulty learning how to read? In this course, we will explore answers to all of these questions and more. The course is designed as an introduction to reading – from orthography and phonology to semantics, syntax, and comprehension – from the multiple perspectives of education, neuroscience, linguistics, and psychology.

**Goals and Objectives**

For each student, the goals of the course are to (1) appreciate the astonishing complexity of the ability to read text; (2) be able to identify and understand the multiple skills and systems involved in reading at the behavioral and neural levels; (3) recognize the components critical to learning to read and building a reading brain; (4) understand how evidence from behavioral and brain research might inform the practice of teaching reading; (5) develop both writing skills and the skills involved in locating, critically reading, and analyzing research articles; and (6) recognize the relevance of the course material to life outside of this class.
Required Reading

- Books (📘)
- Articles (®, ≈)
  All readings for the course are available on-line, at the address provided in the Syllabus (a link can also be found on the Blackboard site), through the Dartmouth Digital Library (designated ≈), or through Electronic Course Reserves (designated ®, linked to through the Blackboard site).

All readings listed are required reading for the course unless designated [optional reading].

General Requirements

- All students are expected to read the material indicated in the Schedule and Reading List by Class below before each class and be prepared to discuss that material in class.
- All students are expected to attend class regularly (including x-periods), on time, and each student is responsible for all material presented and discussed in every class. If you must miss a class, it is your responsibility to borrow the notes from another student, acquire any materials that were handed out, and learn if changes have been made to the syllabus.
- Each student may have two excused absences from class. An absence is excused if a note or e-mail from a doctor, coach, or other College official is provided in a timely manner. All other absences (but see next item) are considered unexcused and will negatively affect the portion of the grade related to attendance and class participation.
- I recognize that some students may wish to take part in religious observances that fall during this academic term. Should you have a religious observance that conflicts with your participation in the course, please speak with me within the first week of the term to discuss appropriate accommodations.
- All students are expected to hand in the assignments outlined below at the beginning of class on the dates specified below and in the Schedule. No extensions of deadlines will be granted without a dean's letter or other similarly documented excuse. Any late assignments will be accepted only at my discretion, with a loss of at least 2 points.
- All students are expected to uphold all aspects of the Academic Honor Principle (refer to http://www.dartmouth.edu/~uja/honor). Your work should be your own and should be prepared specifically for this class. Whenever you make use of outside sources for findings, facts, language, or ideas (including web sites, books, articles, roommates, etc.) you must acknowledge them in formal APA citations (see below for information on APA style). Failure to do so constitutes plagiarism, a serious academic offense that typically involves suspension from the College for a number of terms.
- Students with disabilities enrolled in this course who may need disability-related academic adjustments and services are encouraged to see me privately as early as possible in the term. Students requiring disability-related accommodations must consult the Student Accessibility Services (SAS) office. Once SAS has authorized services, please show me the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential.
Assignments

Four (4) papers are due throughout the term, as indicated in the Schedule below. Paper 1 is due at the beginning of class on Monday 15 April and should reflect material covered in the Introduction, Pre-readers, Orthography, or Morphology classes and readings. Paper 2 is due on Monday 29 April and should reflect material covered in the Phonology, Semantics, Syntax, or Context classes and readings. Paper 3 is due on Friday 10 May and should reflect material covered in the Fluency, Comprehension, or Teaching Reading classes and readings. Paper 4 is due on Friday 24 May and should reflect material covered in the SLI, Dyslexia, or Struggling Adolescent Readers classes and readings.

Each paper is on a topic of your choice, based on the readings and classes from the preceding weeks. What was the most interesting part of the readings or classes? What part did you completely disagree with and why? What part surprised you? What part do you want to know more about? In short, what part really resonated with you and made you think? Choose one specific aspect of the materials covered in class or in readings to write about. Once you have chosen what to write about, find two (2) research articles (not mentioned at length in class or in readings, published in peer-reviewed journals) relevant to your topic and critically incorporate information from those articles into your paper. Each paper is an opportunity for you to do further research on a specific topic of most interest to you.

There are a number of ways to locate research articles for your papers. Dartmouth has an impressive Digital Library (http://library.dartmouth.edu) that makes locating articles easy and is more reliable than a general search engine like Google or Google Scholar. Through the Library, you can access relevant databases such as Medline, PsycInfo, ERIC, or EBSCO Academic Search Premier. By conducting a subject or keyword search within these databases, you can find articles related to your topic of choice. Articles should be empirical, primary source research articles (not commentaries or opinion pieces, research reviews, or meta-analyses) and should be published in peer-reviewed journals.

• Each paper should be typed in a conventional 12-point font (like Times) and double-spaced, with one inch margins on all sides (note that this is not the default for Word; you will need to change the margin settings). Each paper should be about 4 to 5 pages in length (not including references) and all pages should be numbered and stapled together. Doublesided printing is acceptable.
• In-text citations should be in APA style and a reference list in APA style should be included (the reference list is not included in the page count). For details about APA style, refer to the APA Style Summary Sheet for the course (available on the Blackboard site) or directly to The Publication Manual of the American Psychological Association (2010).
• A copy of the first page, including abstract, of any referenced article should be turned in with the paper. Please turn in the first page of the actual article, not the results of a database search. When you make reference to course materials, you do not need to include a copy of the first page of any article or chapter included in the reading list for the course.
• Papers will be graded based on content (engagement with the material, demonstrated understanding of the material, appropriate use of research materials, etc.) and style (spelling, grammar, organization, etc.). Please proofread your assignments carefully for spelling and mechanical errors as well as fluency before turning them in. For details about grading for each assignment, refer to the Grading Criteria document available on the Blackboard site; it may be helpful to refer to this document as you work on each paper.
• Papers are due at the beginning of class—before lecture or activities begin—on each due date. Graded papers will be returned in class (Paper 4 will be returned at the Final Exam).
• For students admitted to or thinking about applying to the Teacher Education Program: Your papers for this course can be used to address State standards and competencies. Think about writing at least some of your papers from a classroom- or practice-based perspective. Remember to save your work from this course for later use in EDUC 41/45 or 42/46 as you develop your portfolios.

• For students who are or are thinking about being Neuroscience majors: In order for this course to count as an elective for the major, your papers must have a neuroscience focus; note that this does not necessarily mean that your papers cannot also have a behavioral or educational focus, but that you must consistently and meaningfully engage with the neuroscience aspect in order for the course to count towards your Neuroscience major.

• If you are finding the papers difficult or frustrating in some way, please talk with me before or after class or in a separate appointment. It is very likely that we will be able to find strategies that will make the papers a more enjoyable learning experience for you.

.Optional Observation Opportunity

• The Stern Center for Language and Learning (www.sterncenter.org), a local non-profit agency that evaluates students struggling with reading and offers individualized instruction, has agreed to allow students from this class to observe an evaluation or intervention session. You may use your observation as the basis for one of your papers.

• This is an option that I encourage you to take advantage of, especially if you are considering the TEP. Please talk with me if you are interested in visiting the Stern Center in West Lebanon.

.Blackboard (https://blackboard.dartmouth.edu)

• Numerous class resources can be found on the Blackboard site for the course, including a copy of the Syllabus, the APA Style Summary Sheet, the Paper Grading Criteria summary sheet, and direct links to Electronic Course Reserves and readings on the web outside of the Digital Library.

• Lecture outlines for each topic will be posted on the site prior to the beginning of each unit. The outlines may be printed and brought to class, and may be helpful for organizing your notes.

.Quizzes and Final Exam

• There will be a number of unannounced quizzes throughout the term, with short questions based on the assigned readings for that day. It may be helpful to read the research articles with the following questions in mind: What was the authors’ question and why was it important? What did the authors do to answer their question? What did the authors find and why was it important? Always read the assigned materials for the main ideas. There are no ‘make ups’ for missed quizzes.

• There will be a cumulative final exam consisting of multiple choice, fill-in-the-blank, short answer, and essay questions. You may refer to handwritten notes on one side of one sheet of standard 8½ x 11 inch paper during the exam; these notes must be handed in with the exam. The final exam will be given during exam period, Sunday 02 June at 8:00 am, and, in accordance with College regulations, cannot be taken at any other time.

.Course Grade

Grades for the course are based on class attendance and participation (10%), grades on each of the four papers due throughout the term (15% each), grades on the quizzes (15%), and the grade on the final exam (15%). Grading is consistent with the ORC description of scholarship ratings (http://www.dartmouth.edu/~reg/transcript/grade_descriptions.html).
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<td>Phonology</td>
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<td>Cunningham, Booth, Kutas</td>
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<td>Teaching Reading: Beyond Nuts and Bolts</td>
<td>Schirmer, McTigue, Connor, Goldenberg, Cummins</td>
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<td>08 May</td>
<td>Teaching Reading: Discussion</td>
<td>Moats (3), Dickinson, Walsh, Stahl</td>
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<td>Dyslexia</td>
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<td>22 May</td>
<td>Struggling Adolescent Readers</td>
<td>Lenz, McClanahan, Greene, Moats, Cantrell, Rezaie, NIFL</td>
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<td>24 May</td>
<td>Putting it all Together: Plasticity</td>
<td>[in-class video]</td>
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<td>27 May</td>
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<td>29 May</td>
<td>Summary and Review</td>
<td>NRC, Kirby, Spear-Swerling, Schlaggar</td>
<td>Question</td>
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<td>Final Exam: Sunday, 02 June, 8:00 am</td>
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*note that the Schedule is subject to change  †see detailed list below*
The Reading Brain

Reading List by Class

• designates readings from required books (Adams, Moats)
® designates readings on Electronic Course Reserves (linked through Blackboard site)
▌ designates readings available on-line through the Dartmouth Digital Library or at the address provided

Week One

Monday, 25 March – Introduction to the Course
An overview of the course content, structure, and requirements. Please read the Syllabus carefully.

Wednesday, 27 March – Introduction: Reading and Language
There is a direct and critical connection between language and reading. This chapter outlines why it is necessary to study language in order to understand reading, one of the themes of the course.

Friday, 29 March – Introduction: The Brain and Methodology
In order to talk about what happens in the brain when children and adults are reading, we need to become familiar with some brain basics. This chapter serves as an introduction to basic neuroanatomy, brain function, and methods for studying the brain and includes arguments for and against the relevance of brain research to education.

Week Two

Monday, 01 April – Introduction: The Brain and Methodology
Continued introduction to basic neuroanatomy, brain function, and methods for studying the brain. NB: This chapter is quite dense; skim it for the main ideas using Byrnes as background and plan to use it as a resource and reference throughout the course (i.e., you do not need to memorize the contents of this chapter – just be familiar with what it offers).

Wednesday, 03 April – Pre-readers
In many ways, knowledge about speech and print in pre-readers serves as a foundation for the later development of reading skills. These readings provide an overview of some of the important language and reading experiences that some children have before they even begin school.


Friday, 05 April – Pre-readers
Continued discussion of important pre-reading skills, with more specifics about development in typical and at-risk children.


Week Three

Monday, 08 April – Orthography
Orthography involves the visual look of a word – from single letters to patterns of letters to the whole word. As would be expected, the visual system is heavily involved in the reading process. Readings for today review how orthographic processing plays a role in reading and how orthographic rules influence knowledge about how to spell words, even in young spellers and readers.


Wednesday, 10 April – Orthography
Continued discussion of how regions and systems in the brain that are involved in visual processing are also involved in the process of reading and a review of evidence from poor readers (children and adults with dyslexia) implicating various visual deficits in at least one subtype of poor reading.


Friday, 12 April – Morphology
A review of evidence on the role of morphological knowledge in reading and learning to read. Are little bits of language – morphemes like -ed or -ing or pre – important to reading? Is there any evidence for a neural morphological system? NB: This is quite a bit of reading; you may skim Carlisle (2003) for the main ideas.


Pinker, S., & Ullman, M. T. (2002). The past and future of past tense. Trends in Cognitive Sciences, 6(11), 456-463. doi:10.1016/S1364-6613(02)01990-3 [this article is optional reading, but I encourage you to read it as it summarizes a classic debate]

Week Four

Monday, 15 April – Phonology
PAPER 1 DUE TODAY
The auditory system is also involved in reading. Put another way, the sounds of language are related to reading. Moats reviews how phonemes are classified and categorized and Bryant et al. investigate the role of phonology in learning to read. Anthony and Francis review the critical concept of phonological awareness from a developmental perspective. NB: You do not need to memorize the phonetic alphabet for purposes of this course.


Wednesday, 17 April – Phonology
Continued discussion of the role of phonology in reading, with a closer look at phonological processing in the brain; remember to read for the main idea.

Adams, M. J. (1994). Beginning to read: thinking and learning about print. Cambridge, MA: MIT Press. Chapters 8: Adding the phonological processor: how the whole system works together (pp. 157-191) and 12: Phonological prerequisites: becoming aware of spoken words, syllables, and phonemes (pp. 293-308 only).


**Friday, 19 April – Semantics**

Reading is not only a process of decoding – the crux of single-word reading is making meaning of the marks on the page. What do we know about how word meanings are organized and used in reading, and how best to teach and learn new words? NB: This is quite a bit of reading, but all of it is accessible; remember to read primarily for the main ideas. Also, in the Adams chapter, focus on the parts about meaning (we will come back to the rest later).


**Monday, 22 April – Semantics**

A continued discussion of vocabulary knowledge, word meanings, and semantic systems in the brain.


**Wednesday, 24 April – Syntax**

Words are organized into phrases, sentences, paragraphs, and texts. We will discuss syntactic processing in terms of the rules governing how words can be combined; the increasing syntactic complexity of speech and text with development; and how, when, and where syntactic information might be processed in the brain.


Fang, Z. (2008). Going beyond the fab five: helping students cope with the unique linguistic challenges of expository reading in intermediate grades. *Journal of Adolescent & Adult Literacy, 51*(6), 476-487. doi:10.1598/JAAL.51.6.4

Friday, 26 April – Context

Readers rarely read single, isolated words; instead, words typically appear on a page with other print and images. We will discuss the role of context in reading and how contextual influence might change over developmental time. NB: Read the Stanovich review article primarily for the information on context, but keep the rest in mind for our discussion session. The Nieuwland and Van Berkum article is dense but fun – read for the main idea.


Week Six

Monday, 29 April – Fluency

PAPER 2 DUE TODAY

The concept of fluency in reading encompasses the idea of fast, automatic, effortless processing of words and texts. Fluency is critical to becoming a skilled reader, yet there is very little research on exactly what fluency is and how best to develop it. Readings for today introduce the concept of fluency and what little we know about fluency in the brain. NB: This is quite a bit of reading; read the research articles for the main ideas.


Wednesday, 01 May – Comprehension

Finally (!) we arrive at the true goal of reading: comprehension. Comprehension involves connecting what you are reading to what you already know and increasing your knowledge at the same time. How does comprehension interact with all the other reading components that we have learned about? What do we know about the comprehending brain?


**Friday, 03 May – Teaching Reading: Theories**

There are two overarching approaches to teaching reading: one is typically referred to as phonics and the other is typically referred to as whole language. What do these two approaches entail? How are these approaches related to what we have learned in this class? Are the two approaches so different that some integration cannot be accomplished, and would there be advantages to such a ‘balanced’ approach?

Adams, M. J. (1994). *Beginning to read: thinking and learning about print*. Cambridge, MA: MIT Press. Chapters 2: Reading words and meaning: from an age-old problem to a contemporary crisis (pp. 13-28) and 15: The proper place of phonics (pp. 409-424).


**Monday, 06 May – Teaching Reading: Beyond Nuts and Bolts**

Throughout the course, we have seen how both the brain and behavioral skills change as children learn how to (are taught how to) read. But there is more to teaching and learning reading than developing and integrating the specific systems that we have discussed; that development is happening in a much wider context, in which things like interest and motivation, socio-emotional wellbeing, individualized instruction, second languages, and socio-economic status all play a role. NB: This is quite a bit of reading, but it is not difficult reading. Please bring the articles to class as we will have small discussion groups.


**Wednesday, 08 May – Teaching Reading: Discussion**

Today we will have a summary discussion about the development of reading skills, the design of reading programs, and the education of teachers who teach reading (that is, all teachers). What do teachers and parents need to know about reading and the brain? Why? What are the elements of a good reading program and how would you design the ideal reading program? Why? Please come to class prepared for a lively discussion. NB: This is quite a bit of reading, but all of it is accessible.


**Friday, 10 May – Specific Language Impairment (SLI)**

**PAPER 3 DUE TODAY**

Some children have difficulty with language even before they begin reading; predictably, many of these children go on to have difficulty with reading. Here, we begin our discussion about specific language impairment, a significant precursor to reading disability. Both of the readings serve as an introduction to SLI.


Monday, 13 May – Specific Language Impairment (SLI)
There are numerous approaches to helping children with SLI develop typical language skills, ranging from traditional sessions with a speech-language pathologist (SLP) to ‘science-based’ computer programs. These readings concern one such computer program called Fast ForWord®.


Wednesday, 15 May – Dyslexia
Readings for today serve as an introduction to the definition and behavioral characteristics of dyslexia or specific reading disability.


Friday, 17 May – Dyslexia
There are multiple theories about the underlying nature and cause(s) of dyslexia; today, you will read about some of the neuroscience of dyslexia (Eden & Moats, Gabrieli), and more specifically about a phonological deficit (Shaywitz), a fluency deficit (Wolf), and a mapping deficit (Wallace).


Monday, 20 May – Dyslexia
What can neuroscience contribute to our understanding of dyslexia and to intervention and remediation approaches? What is happening in poorly reading brains?

Wednesday, 22 May – Struggling Adolescent Readers
Today we focus on adolescents who are struggling with reading, who may or may not meet the criteria for a diagnosis of dyslexia. How would you address the needs of these students, given what you now know about reading? The articles for today provide some suggestions. NB: This is quite a bit of reading in terms of number of pages, but most of it is pretty easy reading. Please bring the articles to class as we will have small discussion groups.
McClanahan, B. (2009). Help! I have kids who can’t read in my world history class! Preventing School Failure, 53(2), 105-111. doi:10.3200/PSFL.53.2.105-112
Friday, 24 May – Putting it all Together: Plasticity and Development

PAPER 4 DUE TODAY

Today we will be returning to the beginning, revisiting pre-reader skills and working our way back up through beginning reading skills to dyslexia. The theme is the incredible plasticity that allows us to develop – as readers and as teachers – a brain that can read.

We will be viewing The child’s brain: from syllable to sound (Episode 2) from the series The secret life of the brain today in class. [Thirteen/WNET New York (Producer). (2001). The secret life of the brain [Motion picture]. United States: PBS Home Video. (52 min.).]

Week Ten

Monday, 27 May – No class: Memorial Day (reading period)

Wednesday, 29 May – Summary and Review

Post a question on the Blackboard Discussion Board that you think would be good for the final exam. We will review the questions (as many as we can) in class. These readings provide a relatively good summary of many of the themes of the course; they should be useful as you prepare for the final exam.

National Research Council (1998). Chapter 2: The process of learning to read. In C. E. Snow, M. S. Burns, & P. Griffin (Eds.), Preventing reading difficulties in young children (pp. 41-84). Washington, DC: National Academy Press. This chapter is available at the following address:

http://books.nap.edu/html/prdyc/ch2.html

