

COURSE OVERVIEW

Brain and Mind is an integrated course that ranges from basic neuroscience and gross anatomy of the head and neck to neurological diagnosis and psychopathology. Over 100 faculty members from many different departments are involved in teaching the course, with the core faculty drawn from the Departments of Neurology & Neuroscience, Pathology, Pharmacology, Physiology & Biophysics, Psychiatry, and Radiology. The course synthesizes basic science and clinical information about the nervous system to promote both the acquisition of fundamental knowledge and the development of diagnostic skills. The teaching modalities that are utilized emphasize active student participation. Important features are the problem-based analysis of classical neurological and psychiatric disorders, and the opportunity to examine individual patients in clinic settings. Information on key topics is provided in the form of lectures, patient presentations and small-group tutorials, as well as laboratory sessions on neuroanatomy and gross anatomy of the head and neck. Acquaintance with contemporary research ideas and techniques is fostered by journal club sessions that review papers from the current literature. Computer-based educational and research tools enhance many of these activities.

Course Design Group Faculty

Dr. Bernice Grafstein (Physiology & Biophysics) (Course Co-Director)
Dr. Peter Marzuk (Psychiatry) (Course Co-Director)
Dr. Joseph Safdieh (Neurology & Neuroscience) (Course Associate Director)
Dr. Betty J. Casey (Psychiatry)
Dr. Charles Inturrisi (Pharmacology)
Dr. Ehud Lavi (Pathology)
Dr. Teresa A. Milner (Neurology & Neuroscience)
Dr. Estomih Mtui (Neurology & Neuroscience)
Dr. Robert Zimmerman (Radiology)

Other departments involved:

Neurological Surgery, Ophthalmology, Anesthesiology, Otorhinolaryngology

(Brief biographical notes on the members of the Course Design Group Faculty may be found on the Brain and Mind Course web site.)

Student Representatives to the Course Design Group

Lindsey Bornstein (lib2011@med.cornell.edu)
Andrew Drysdale (atd2003@med.cornell.edu)

COURSE ORGANIZATION

Sequence of Principal Themes:

- Week 1-2: General nervous system structure and function
- Week 2-3: Somatosensory systems, pain
- Week 3-4: Motor systems
- Week 5: Cranial nerves
- Week 6: Visual system, eye movement
- Week 7: Vascular system & metabolism, consciousness
- Week 8: Auditory & vestibular systems
- Week 9: Limbic system
- Week 9-11: Cognitive function: memory, emotion, attention

Problem-Based Learning (PBL)

The backbone of the course is a series of cases embodying important clinical entities in neurology and psychiatry. These cases have been selected to provide the basis for an orderly development of knowledge in basic and clinical neuroscience.

Lectures and Patient Presentations

Lectures deal with key topics in both the basic science and clinical areas. Lecturers have been selected for their skill in this form of teaching as well as their expertise in particular subjects.

Laboratories and Small Group Sessions

Clinical Anatomy Dissection and Imaging Laboratory. The anatomy of the head and neck is an important component of this course, leading into a view of the brain and spinal cord in relation to their surrounding structures. The laboratory sessions include dissection, examination of prosections and models, and correlations with radiological images.

Functional Neuroanatomy Laboratory. Computer-based exercises and small-group tutorials are used to convey a three-dimensional perspective of brain structure and its functional correlations.

Small Group Tutorials. These include sessions on neuropathology, neuroradiology, neuropharmacology, brain imaging and behavioral science. Various learning modalities are involved, including problem sets, discussion of scientific papers and computer-based exercises.

Clinical Experiences

Afternoon sessions in diagnosis of neurological disease and psychopathology provide direct patient contact to enable students to develop their interview and diagnostic skills in these areas.

Psychopathology. The clinic sessions take place on Tuesday afternoons at the Payne Whitney Clinic and at the Westchester Division of New York-Presbyterian Hospital, with about half the class at each. Each student has the opportunity to interview and observe patients with serious mental illnesses. In the sessions students are instructed in interview techniques, clinical evaluation of psychopathology, organization and written presentation of clinical information, and diagnostic formulation.

Physical Diagnosis of Neurological Disease. Three-hour afternoon sessions usually occur on Wednesdays, Thursdays and Fridays, with about one-third of the class attending on each of these days. In two periods the students are instructed in the principles of neurological testing and practice the tests on one another; one period involves “standardized patients”, and two periods involve examination of patients in a clinic or office setting at New York-Presbyterian Hospital, Memorial Sloan-Kettering Cancer Center, Burke Rehabilitation Hospital in Westchester or other network hospitals. This series also includes patient presentations and clinical problem-solving sessions on motor, sensory and visual disorders, as well as instruction in the use of the ophthalmoscope.

Journal Clubs

Articles selected from the current literature in neuroscience research are discussed, with emphasis on the analysis of experimental design and technique, as well as the significance of the results. Related articles for general readers highlight the broader scientific and social significance of the Journal Club articles. In 2010, "Supporting Cells of the Nervous System" will be the common theme of the Journal Club articles.

MATERIALS THAT ARE PROVIDED

Transcripts of lectures and outlines for small group tutorials for each week of the course, available on the Friday of the preceding week through the course website/iPad.

“Background Briefs” for Journal Clubs, outlining the concepts and information important for undertaking the assigned paper(s), available on course website.

The Cornell Guide to the Neurological Examination will be posted on the course web site.

Neurology Physical Diagnosis Overview, including objectives of the neurological testing exercises and instructions for the procedures and requirements for these exercises.

Guidelines for Psychopathology Clinics, including instructions for the interview and assessment of psychiatric patients, and requirements for patient write-ups.

Outlines for the Clinical Anatomy Labs.

Copies of Atlas of Anatomy, Gilroy, MacPherson & Ross, 2008 will be provided for use in the Clinical Anatomy labs.

Outlines and illustrations for Functional Neuroanatomy Labs

Pharmacology Guide for Brain and Mind, including learning objectives, key drugs, reading assignments, and a “map” of pharmacology topics in the course.

NOTE: This guide should be used weekly as a “roadmap” for preparing for pharmacology material in various sessions (lectures, small groups, and PBL).

Neurological testing instruments:

Reflex hammer, tuning fork and flashlight are a gift in honor of Dr. John Caronna.

N.B. As far as possible, electronic versions of the distributed materials, as well as slides from PowerPoint lecture presentations, will be made available on the Brain and Mind Web site. The formal lectures in the course are routinely videotaped, and procedures for viewing the videotapes will be announced.

RECOMMENDED TEXTBOOKS

- Blumenfeld, H. *Neuroanatomy through Clinical Cases, 2nd ed.* 2010. Sinauer.
This text is provided to all students this year as a gift from the Buster Foundation in honor of Dr. John Caronna.
(It will be used in the course as a source of clinical examples related to neuroanatomy, and has an excellent section on the neurological exam. However, it does not provide complete coverage of some important topics in the course, so students should use one of the recommended neuroscience textbooks in addition.)
- Neuroscience text:
EITHER

Purves, D. et al. *Neuroscience, 4th ed.* 2007. Sinauer. (This book has very good coverage of material and is very readable, with excellent diagrams.)

OR

Kandel, E.R., Schwartz, J.H. and Jessell, T.M. *Principles of Neural Science, 4th ed.* 2000. McGraw-Hill. (This is a detailed and authoritative text, and is highly regarded. However, it may be too cumbersome for students who are not already familiar with it.)

(Additional useful resources by faculty members:
Fitzgerald, M.J.T., Gruener, G., and Mtui, E. *Neuroanatomy and Neuroscience, 5th ed.* 2007. Saunders/Elsevier.
Rubin, M. and Safdieh, J.E. *Netter's Concise Neuroanatomy.* 2001. Saunders.)
- Andreasen, N.C. and Black, D.W. *Introductory Textbook of Psychiatry, 5th ed.* 2010 American Psychiatric Publishing.
- Moore, K. L. and Dalley, A. *Clinically Oriented Anatomy, 6th ed.* 2009. Lippincott Williams & Wilkins.
- Tank P. W., *Grants Dissector, 13th ed.* 2005. Lippincott Williams & Wilkins
- Netter, F. H. *Atlas of Human Anatomy, 5th ed.* 2010. Saunders/Elsevier

- Kumar, V. et al. *Robbins and Cotran Pathologic Basis of Disease, 8th ed.* 2009. Saunders/Elsevier (This edition will also be used in the Basis of Disease course following Brain and Mind.)
- Katzung, B.G. *Basic and Clinical Pharmacology, 11th ed.* 2009. Lange/McGraw-Hill. (Specific page references in this text are given in the Pharmacology Guide.)
- Wilson-Pauwels, L. et al. *Cranial Nerves in Health and Disease, 2nd ed.* 2002. BC Decker Inc. **This text is loaned to all students.** Its return at the time of the Triple Jump Exam will be required for obtaining Part II of the exam. (Students who do not return the book in good condition will be required to purchase a new replacement.)

STUDENT ASSESSMENT

Quizzes and Practical Exams

On most weeks, a 50-minute quiz is used for an objective assessment of the student's comprehension of substantive information from the lectures, small group tutorial sessions, patient presentations, PBL cases, Journal Club, Functional Neuroanatomy Laboratories and Clinical Anatomy Laboratories. The quizzes are usually a test of the **previous week's material**.

Although the quizzes include questions on the Clinical Anatomy and Functional Neuroanatomy components, the final course grades for these components are determined by practical exams of cumulative knowledge in each of these areas, given toward the end of the course.

Clinical Skills Assessment

The clinical preceptors will provide quantitative and narrative assessments of student performance, including patient write-ups. In the Psychopathology Clinics and the Neurological Physical Diagnosis sessions each student is required to produce 2 patient write-ups, which are graded by the preceptor. Each student will be assessed on the ability to perform a neurological examination of a "standardized patient".

Triple Jump Examination

During the last two days of the course, students undergo an examination based on a case similar to those discussed in the PBL sessions, consisting of three components: a written analysis of the case, overnight independent study of the original case material plus additional information about the case, and then additional written analysis of all parts of the evolving case. The students use classroom computers for the written portions of the examination.

Other Performance Assessments

The preceptors in the PBL sessions and Journal Clubs will provide quantitative assessments of each student's performance on the basis of attendance, participation in discussion and quality of contribution. These preceptors, as well as those in the various small group activities, will also provide narrative comments about student performance where appropriate.

Formative Feedback on Performance During the Course

Students receive formal formative feedback in a number of venues in the course including PBL (mid-course feedback session with the neurology PBL facilitator), un-graded “practice” patient write-ups in clinical sessions, the standardized patient for the neurological exam and ophthalmoscope practice sessions, and self-assessment questions in Pharmacology and in Functional Neuroanatomy. Regular quizzes also provide students with an ongoing assessment of their knowledge base.

Students can contact their small group facilitators (PBL, JC, clinical anatomy, psychiatry preceptor, etc.) or a faculty member of the course design group for additional help.

The course directors will be available for walk-in consultations as follows:

Dr. Grafstein 2-4 p.m. Wednesdays

Dr. Marzuk 2-4 p.m. Thursdays

Dr. Safdieh 2-4 p.m. Mondays

Appointments can be made for other times.

Dr Carol Capello, Associate Director of the Curriculum Office (cfc2002@med.cornell.edu, 212-746-1093, or room C-205) can provide guidance for students on study strategies.

Student Assessment

This course is graded on a Pass-Fail basis. In order to pass the course, the student must have achieved a passing grade of at least 65% in each of the 8 course components, which consist of the following:

1) Exams:

Weekly quizzes
Clinical Anatomy
Functional Neuroanatomy
Triple Jump Examination

2) Analytical skills and professional attributes:

PBL
Journal Club
Psychopathology Clinics
Neurology Physical Diagnosis

Failure in 1-3 of these components will result in a *Marginal* grade, which will require remediation of each of the individual components that were failed. The remediation will consist of further study and/or examination, as determined by the Course Directors, to be completed at a time specified in the Academic Calendar. Failure of remediation of any component will result in a grade of *Failure* for the course as a whole, which will require appropriate further remediation as indicated in the Guidelines for Promotion and Graduation. Likewise, failure of 4 or more of the course components will result in failure of the course as a whole.

RECENT CHANGES IN THE BRAIN AND MIND COURSE

A number of changes have been made in the Brain and Mind course in the last two or three years, many of them in response to student comments.

- A Standardized Patient exercise in the Clinical Skills Center has been made part of Neurological Physical Diagnosis.
- A lecture on ophthalmologic diseases and a practical tutorial on the use of the ophthalmoscope have been introduced.
- New material on higher functions, including a lecture on emotion and labs on plasticity and frontal lobe function have been added.
- A Pharmacology guide with learning objectives, reading assignments, key drugs concerning the CNS, and a “map” of topic location in the course and pharmacology self-assessment questions (PSAQs) have been introduced.
- An on-line Functional Neuroanatomy resource that allows students to localize anatomic landmarks of the brain and spinal cord and identify structures, and that contains tutorials and self-assessment questions is provided.
- The format for PBL has been modified (“PBL 2.0”) to make it more collegial and interactive for all students.
- The number of weekly quizzes has been reduced from 9 to 7.
- Five quizzes/exams now occur on days other than Mondays.
- Quiz grades are now posted through the secure ANGEL course site typically a few days after the quiz has been administered.
- Course Directors have designated office hours when they are available for consultation.

GUIDELINES FOR PBL SESSIONS

Format

Each PBL case has 2 student sessions, in which *it is up to the students to take the initiative, with the preceptor serving as a facilitator of the students' activities*. The usual procedure is for the preceptor to distribute the first section of the case, which a student then reads aloud. The students then discuss the important issues that they need to inform themselves about in order to analyze the case. When the discussion appears to be complete, another section of the case is distributed and read, and so on. At the end of the first session, the students draw up a list of learning issues to guide their preparation for the following session. They then organize themselves in 2- or 3-member groups to research individual learning objectives and draw up a list of 4-5 key talking points which they will discuss with their fellow students and facilitator during the second session. *In order to be able to contribute to the discussion, all the students in the PBL group are expected to have a grasp of the key concepts of all the learning objectives.*

For each neurology case, the whole class will assemble after the last student session for the half-hour Expert Session, in which the case supervisor will review the principal issues of the case and answer students' questions about unresolved issues.

GUIDELINES FOR JOURNAL CLUB SESSIONS

Distribution of Materials

One or two papers are assigned for discussion in each session. It is expected that students will prepare for each session by reading the “Background Brief” and the assigned paper(s), as well as related articles directed to general readers, which will give students an insight into the current scientific and social relevance of the assigned papers. In addition, there may be references to material in the recommended textbooks and lecture handouts that will help in understanding the paper under discussion, as well as references to papers for further reading for those who wish to go into the subject in more detail. Because of copyright restrictions, the papers for discussion and background reading can be made available to the students only in electronic form through the Web site for the Brain and Mind course. In addition, 2 copies of each paper and its associated materials will be placed on reserve in the library. Each student may make one printed copy of the paper for his/her own use.

Format

These 7 sessions are carried out in the same groups of 10-12 students as the PBL sessions. At the beginning of each of the Journal Club sessions, the Preceptor will make a short presentation of background material for orientation. The students then are expected to take the initiative, with the preceptor serving as the facilitator, to present and discuss different parts of the assigned paper. (Please note that, in contrast to some other courses, attendance at Journal Club sessions is mandatory and is considered in the determination of the final grade for this component. Also, questions on the Journal Club material are included in the weekly quizzes.)

GUIDELINES FOR PSYCHOPATHOLOGY CLINICS

See information provided in separate booklet.

GUIDELINES FOR SESSIONS IN NEUROLOGICAL PHYSICAL DIAGNOSIS

See information provided in separate booklet.

SPECIAL INSTRUCTIONS FOR STUDENTS

Attendance

In accordance with the Attendance Policy of the Medical College, attendance is expected at all course sessions including lectures, labs, small groups and clinical activities, with no exceptions. In some formats, particularly where student participation plays an essential part of the learning process, i.e., small groups such as tutorials, PBL, Clinical Anatomy labs or Journal Club or where direct observation of clinical cases, lab specimens, or computer or radiographic images is required, regularity of attendance is one of the criteria on which student assessments are based. Unexcused absences may result in significant reductions in the grades for these components (i.e. 10% deductions for each unexcused absence). Students seeking an excused absence for any session (PBL, JC, labs, clinical sessions, quizzes etc) must request and obtain permission from the Course Directors. *Please follow the policies in the student handbook about what constitutes an excused absence and the procedures for request and notification of course directors.* Special circumstances that arise should be discussed with Dr. Grafstein.

(bgraf@med.cornell.edu, telephone 212/746-6364, Room D-417B) or Mr. Albert Rosado (alr2021@med.cornell.edu, telephone 212/746-1048, Room C-209).

Attire and Instruments

Students are requested to wear white coats (with ID badges) for patient sessions, including Patient Presentations in the morning schedule, the Motor Clinics at Burke Rehabilitation Hospital, the Standardized Patient and Patient Testing sessions in Neurological Physical Diagnosis, and the Psychopathology Clinics. The following neurological testing instruments are required (these instruments will also be used in the Third Year Neurology rotation):

- stethoscope
- ophthalmoscope (need not be the most expensive kind)
- visual acuity test cards (available in Medical College Bookstore)
- reflex hammer, tuning fork and flashlight (provided as gifts in honor of Dr. John Caronna).

The instruments should be brought to all practice and patient-testing sessions in Neurological Physical Diagnosis.

Transportation to Off-site Locations

Students traveling to off-site locations should ascertain the time that the assigned vehicles will be leaving WMC, and if necessary provide themselves with a bag lunch. We regret that we are unable to arrange for alternative transportation if you miss the bus.

ASSIGNMENT	DEPARTURE FROM WMC TIME & PLACE	DEPARTURE FOR WMC TIME & PLACE
Psychopathology Clinics (Westchester Div.)	12:30 p.m. Tuesdays 1300 York Ave.	3:45 p.m. Tuesdays Information Building
Motor Clinics (Burke Rehab. Hosp., Westchester)	1:30 p.m. Dates as announced 1300 York Ave.	5:30 p.m. Dates as announced Administration Building
Neurological Exam. (Various sites)	1:15 p.m. Dates as announced	5 p.m. Dates as announced.

Important Communications from Course Leaders and Faculty

Students are expected to check the 2nd year bulletin boards, their WCMC email and the B&M ANGEL course site regularly for important information and updates during the course. Email queries to course directors, course design group members or course faculty at night or on weekends cannot necessarily be answered at those times.

Course Evaluation and Student Feedback

Completion of the course evaluation administered through E-VALUE at the end of the course within one week of the course end date is a course requirement. The course design group values student input and uses it in considering changes to the course for the future. During the course it is recommended that students who have specific suggestions or concerns bring them to the attention of the student representatives on the course design committee.