While You Were Sleeping
Course Syllabus
CAMS-UA 170

Sleep is something akin to the ocean – it surrounds us, and we could not live without it; yet it remains a mystery, whose secrets we are only now beginning to unfold. Scientific research into sleep and dreams began in earnest about 50 years ago. Since that time, the small and burgeoning field of sleep medicine has taught us a great deal about how and why we sleep. This course will provide students with a comprehensive introduction to sleep and dreams throughout the lifecycle. Our study will include a focus on normal sleep behavior and physiology, the evolution of sleep, circadian and biological rhythms, dreams, and the diagnosis and treatment of sleep disorders. Through lectures, readings, exercises and assignments, students will learn about the importance of sleep for mental and physical wellbeing and how to best establish a healthy sleep routine.

**Time/Location:**
Tuesdays & Thursdays: 12:30 – 1:45 PM

**Instructors:**
Jess P. Shatkin, MD, MPH (646-754-4900, jess.shatkin@nyumc.org)
Argelinda Baroni, MD (212-263-6622, argelinda.baroni@nyumc.org)

As a society we firmly believe in a triumvirate of health – a balanced diet, plentiful exercise, and adequate sleep. When we encounter a friend or colleague who eats a well-rounded diet, we praise him; if he exercises regularly, we admire his determination and perhaps evince some envy; but when we learn that he regularly sleeps eight hours each evening, we are sorely tempted to believe him undisciplined, lacking a proper work ethic, and incapable of meeting his responsibilities. In this course, we will explore the mysterious and largely uncharted world of sleep and dreams. We will question many of our most basic assumptions and biases about the role of sleep in our lives and discover the importance of sleep in optimizing our physical and mental health.

Our course is broken into five major themes: (1) Defining sleep; (2) dreams; (3) the evolution of sleep; (4) sleep regulation; and (5) sleep disorders and treatment. We will begin our study by defining the state of sleep as we understand it today with the aid of various self-report and physiological measures, such as polysomnography. We will then review the history of sleep, focusing on discovery over the past 100 years, and how wakefulness, sleep cycles, and stages of REM and Non-REM are defined.
One of our nation’s best-known sleep scientists, William Dement, has noted that “dreaming permits each and every one of us to be quietly and safely insane every night of our lives.” Dreams have captivated the imagination of every society and been viewed as everything from divine inspiration to meaningless garble. Some data suggests that dreams serve a valuable cognitive purpose and are important for processing emotional experiences, rehearsing instinctual behaviors, and consolidating memory. We will break our study of dreams into two sections – the first of which will focus on the content of dreams. Students will be provided with a rubric for recording, interpreting and analyzing their dreams, which will be utilized to complete a dream journal to be handed-in for review by the instructor at various points during the term. Later in the course, after students have learned more about neuroanatomy and sleep physiology, we will study the science of dreams.

During our third unit, we will study the neuroscience and biochemical processes of importance during wakefulness and sleep. We will explore the evolution of sleep and phylogenetic differences throughout the animal kingdom, considering when, how, and why sleep arose in various species and the forms that sleep has taken throughout evolution. When did Rapid Eye Movement (REM) sleep arise, and what is its purpose? Can we determine which type and stage of sleep is most important to the healthy development and growth of an organism? Which animals does human sleep most closely resemble and why? Sleep begins in utero during fetal development and changes a great deal throughout the lifecycle. We will seek to determine the reasons for these changes and the risks and benefits of this ontological metamorphosis.

As we progress into our fourth unit, we will discover that our circadian and biological rhythms closely mirror the rhythms of our universe. Our bodies, day and nighttime activities, and sleep are intimately tied to the rising and setting of our sun and the revolutions of our planet. That we keep a 24-hour day in concert with the earth is by no means a coincidence. As we learn about sleep debt, homeostasis, clock-dependent alerting, and human physiology, we will find that our very sense of who we are and how we experience others and our environment are intimately tied to how we sleep and wake, the time spent in these various states, and what happens during our sleep. We will also revisit the priority of sleep within our society and question public policies that impact sleep, such as school start times and medical resident work hours. Finally, we will employ all of our observations to date and discover the benefits of sleep hygiene, the “do’s and don’ts” of establishing and maintaining refreshing sleep, and the effects of caffeine, tobacco, illicit drugs, and alcohol on our sleep.

Our final unit will be devoted to the study of various forms of sleep pathology and their treatment. We will discuss sleep impairments affecting children, adolescents, and adults, such as sleep disordered breathing (e.g., apnea and snoring), both REM and Non-REM parasomnias (e.g., sleep behavior disorders, such as sleepwalking, bedwetting, nightmares, and sleep terrors), insomnia, narcolepsy, and the impact of various physical illnesses and prescribed medications on sleep. We will also study the relationship between sleep pathology and neuropsychiatric illness. Our course will conclude with a discussion of the most effective behavioral, surgical, and medication treatments for these disorders.
# SYLLABUS

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignment Due</th>
</tr>
</thead>
</table>
| 1       | **Defining Sleep**  
*Introduction  
*Why study sleep  
*Methods of investigating sleep | Dement, Ch 1 – 2;  
Klinkenberg, 1997;  
Moorcroft, Prologue & Ch 1 | |
| 2       | *History of sleep medicine | Dement, 2005 | |
| 3 – 4   | *Sleep cycles & stages | Zolovska & Shatkin, 2013 | |
| 5 – 6   | **Dreams I: The Dream Maker**  
*Recording dreams  
*Dream journals  
*Decoding dreams  
*Lucid dreaming | Dement, Ch 13 – 14 | |
| 7       | **The Evolution of Sleep**  
*Phylogeny of sleep (sleep in animals) | Cirelli & Tononi, 2008;  
Siegel, 2008; | *Personal Sleep Assessment (Stanford and Epworth Scales) |
| 8       | *Ontogeny of sleep (sleep throughout the life cycle)  
*Sex & cultural differences | Jenni & Werner, 2011 | |
| 9 – 10  | *The sleeping brain | Moorcroft, Ch 4 | |
| 11 – 12 | **Sleep Regulation**  
*Sleep debt & the effects of sleep loss | Bonnet & Arand, 1995  
Dement, Ch 3 & 9 – 10  
Jones, 2011  
Kramer, 2010  
Ohlmann & O’Sullivan, 2009;  
Bixler, 2009 | |
| 13 – 14 | *Circadian rhythms | Dement, Ch 4 – 5  
Moorcroft, Ch 2 – 3 | *Munich Chronotype Questionnaire |
| 15      | **MIDTERM EXAM** | | |
| 16 – 17 | *Sleep physiology | Dement, Ch 11  
Moorcroft, Ch 5, 12 – 13 | *Sleep Logs (4 consecutive weeks) |
| 18 – 19 | *Sleep Hygiene | Dement, Ch 12, 17 – 18  
Stepanski & Wyatt, 2003  
Roehrs & Roth, 2008 | |
| 20 – 21 | **Dreams II: The Science of Dreams**  
*Physiology of dreams  
*Psychological theories  
*Current neurocognitive models | Moorcroft, Ch 6 – 7 |
| 22 – 23 | **Sleep Disorders & Treatment**  
*Insomnia | Morin & Benca, 2012;  
Dement, Ch 6;  
Moorcroft, Ch 9 – 10;  
*Sleep Improvement Program (with additional one week of sleep logs, Epworth, and Stanford Scales) |
| 24 | *Circadian rhythm disorders | Bjorvantal & Pallesen, 2009 |
| 25 – 26 | *Parasomnia  
*Nightmares  
*Sleep in psychiatric disorders | Shatkin et al, 2002;  
Talbot, 2009;  
Thakkar, 2013  
*Community Sleep Project, or  
*Dream Log Assignment |
| 27 – 28 | *Sleep Apnea  
*Narcolepsy  
*Sleep Movement Disorders | Dement, Ch 7 – 8  
Moorcroft, Ch 10 – 11  
Earley, 2003 |

**Readings**

**Books:**  
On line access: [https://getit.library.nyu.edu/go/8019151](https://getit.library.nyu.edu/go/8019151)

**Articles:**  


*Grading will be determined as follows:

**Examinations (50%)** – Both a midterm and a final exam, non-cumulative, will be required of students; each exam will be worth 25% of the grade. Exams will be multiple choice and short-answer in format.

**Sleep Improvement Program (25%)** – Students will maintain a sleep log for at least 5 weeks of the course using a standardized format provided. Students will also study their sleep by completing the Epworth and Stanford Scales and the Munich Chronotype Questionnaire. (All rating scales can be found on NYU Classes posted under While You Were Sleeping/Resources/Sleep Rating Scales). Based upon the data gathered from their sleep logs, scales, and questionnaires, in addition to course readings and discussions, students will first analyze their sleep data and reflect upon their observations. Students will then engage in a one week experiment, implementing a sleep improvement program, following evidence-based parameters and based upon the data they have gathered about their own sleep; during this week, students will record another week of sleep logs. Students will then write a 5 – 7 page, double-spaced paper in which they measure the effectiveness and outcomes of the sleep improvement program, which will be submitted along with: (1) the initial 4 weeks of consecutive sleep logs; (2) a final 5th week sleep log which reflects the week of the sleep improvement program; (3) a pre- and post-Epworth scale; (4) the Munich Chronotype Questionnaire; and (5) a pre- and post-Stanford Sleepiness Scale.

**Students have the option of completing one of the following two assignments:**

**Dream Log Assignment (25%)** – For those students who wish to study their dreams, you will be provided with a standard dream log notebook. The format of these notebooks will be reviewed in class. Based upon additional guidelines provided in class for dream interpretation, students will analyze two of their dreams and write a 7 – 10 page double-spaced paper.

**or**

**Community Sleep Project (25%)** – This assignment recognizes the great dearth of understanding and accurate public information about sleep in America and particularly among college students. Students will design a project aimed at educating their peers about sleep focused on a single issue, such as sleep hygiene, a particular sleep pathology of interest, a public policy that directly or indirectly impacts sleep, driving or other situations where drowsiness presents a hazard, alcohol and substance use, or a theme of the students’ choosing. All topics must be preapproved by the instructors. Students are encouraged to be creative in their
presentations, some of which may be show-cased in class. Students may wish to consider a public service announcement, video or video essay, webcast, brochure, literature review, or poster format for their project.

**Policy on Late Submissions:** Late papers and projects will be accepted. However, grades on all late papers and projects will be lowered by 1/3 for each day they are late (e.g., from an A- to a B+ on late day #1, from a B+ to a B on late day #2, etc.). Under no circumstances will any papers or projects be accepted after the date of the final exam. Papers and projects received after this date will not be graded and will receive a score of zero. Students requesting an exemption from the late submission policy must present a written note from a school Dean, Academic Advisor, or personal physician (e.g., not the student’s parent or family member) justifying the late submission, which will then be considered by the instructors.