

PSYC 490 - NEUROSCIENCE AND THE SOUL

SPRING 2015/2016

BGC 138

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Catalog Description and Prerequisites:

This course addresses the impact that recent discoveries in the interdisciplinary field of neuroscience have on our understanding of the soul and human nature. It explores the various theological and philosophical positions about the soul and examines recent neuroscientific data and frameworks proposed to explain our psychological experience. Prerequisites: Requires PSYC 101, BITH 315, and PHIL 101 or consent of the instructor.

Required Texts:

- Brown, Warren S. and Strawn, Brad D. The Physical Nature of Christian Life: Neuroscience, Psychology, and the Church, Cambridge University Press. 2012
- Moreland, J.P. The Recalcitrant Imago Dei: Human Persons and the Failure of Naturalism. SCM Press. 2009.

Course Reading Packet:

- Barbier, Johan S., Gabriëls, Loes, van Laere, Koen, and Nuttin, Bart. Successful Anterior Capsulotomy in Comorbid Anorexia Nervosa and Obsessive-Compulsive Disorder: Case Report. *Neurosurgery*. 69 (3):E745-E745.
- Bronstein, JM; Tagliati, M; Alterman, RL; Lozano, AM; Volkmann, J; Stefani, A; Horak, FB; Okun, MS; Foote, KD; Krack, P; Pahwa, R; Henderson, JM; Hariz, MI; Bakay, RA; Rezai, A; Marks, WJ Jr; Moro, E; Vitek, JL; Weaver, FM; Gross, RE; DeLong, MR. (2010) Deep Brain Stimulation for Parkinson Disease: An Expert Consensus and Review of Key Issues. *Archives of Neurology*, 68(2):165-165.
- Buchman, Daniel Z., Skinner, Wayne and Illes, Judy. (2010) Negotiating the Relationship Between Addiction, Ethics, and Brain Science. *American Journal of Bioethics: Neuroscience*, 1 (1):36-45.
- Burns, J.M.; Swerdlow, R.H. (2003) Right orbitofrontal tumor with pedophilia symptom and constructional apraxia sign. *Archives of Neurology*, 60 (3):437-440.
- Carrazana, Enrique and Cheng, Jocelyn (2011) St Theresa's Dart and a Case of Religious Ecstatic Epilepsy. *Cognitive & Behavioral Neurology*, 24 (3):152-155.
- Choudhury, Suparna and Slaby, Jan. Critical Neuroscience. Wiley-Blackwell. 2012. Chapter 4. *Scanning the Lifeworld.*; Chapter 14. *Cultural Neuroscience as Critical Neuroscience in Practice*.
- Christen, Markus, Bittlinger, Merlin, Walter, Henrik, Brugger, Peter, and Müller,

- Sabine. (2012). Dealing With Side Effects of Deep Brain Stimulation: Lessons Learned From Stimulating the STN. *American Journal of Bioethics: Neuroscience* 3 (1):37-43
- Cooper, John W. Body, Soul & Life Everlasting: Biblical Anthropology and the Monism-Dualism Debate. Eerdmans, Grand Rapids, MI. 1989. *Chapter 1. Traditional Christian Anthropology and Its Modern Critics. Chapter 5. The Monism-Dualism Debate about New Testament Anthropology. Chapter 10. Holistic Dualism, Science, and Philosophy.*
 - Csigó, K., Harsányi, A., Demeter, Gy., Rajka, Cs, Németh, A. and Racsmány, M. (2010) Long-term follow-up of patients with obsessive-compulsive disorder treated by anterior capsulotomy: A neuropsychological study. *Journal of Affective Disorders*, 126 (1–2):198–205.
 - The Human Person in Science and Theology. Eds. Gregersen, Neils Henrik, Drees, Willem B., and Gorman, Ulf. Eerdmans, Grand Rapids, MI. *Chapter 3 - The Multifaceted Nature of Human Personhood: Psychological and Theological Perspectives by Fraser Watts. Chapter 5 – Imago Dei: The Possibility and Necessity of the Human Person by Philip Hefner.*
 - In Search of the Soul: Four Views of the Mind-Body Problem. Eds Green, Joel B. and Palmer, Stuart L. (2005). InterVarsity Press, Downers Grove, IL. *Chapter 3 - On Behalf of Emergent Dualism by William Hasker. Chapter 5 - The Constitution View of Persons by Kevin Corcoran.*
 - Hall, M. E. L. (2010). What are bodies for?: An integrative examination of embodiment. *Christian Scholar's Review*, 39(2):159-176.
 - Heyes, Cecilia (2010) Where Do Mirror Neurons Come From? *Neuroscience and Biobehavioral Reviews*, 34:575-583.
 - Hoekema, Anthony. Created in God's Image. Eerdmans, Grand Rapids, MI. 1986. *Chapter 5: The Image of God: A Theological Summary. Chapter 11: The Whole Person.*
 - Knabb, Joshua J, Welsh, Robert K, Ziebell, Joseph G, and Reimer, Kevin S. (2009). Neuroscience, Moral Reasoning, and the Law. *Behavioral Sciences and the Law*, 27:219-236.
 - Leben, Derek. (2011) Cognitive Neuroscience and Moral Decision-making: Guide or Set Aside? *Neuroethics*, 4 (2): 163-174.
 - Lee, J-H; Ryu, J; Jolesz, FA; Cho, Z-H; and Yoo, S-S. (2009). Brain-Machine Interface Via Real-Time fMRI: Preliminary Study on Thought-Controlled Robotic Arm. *Neuroscience Letters*. 450:1-6.
 - Markham, Paul N. Rewired: Exploring Religious Conversion. Pickwick Publications, Eugene, OR. 2007. *Chapter 4 – Rewired: Re-Imagining Christian Religious Conversion.*
 - McGilchrist, Ian. The Master and His Emissary. Yale University Press, 2010. *Chapter 2 - What Do the Two Hemispheres 'Do'?: Chapter 4 - The Nature of the Two Worlds.*
 - Morrison, Samantha, Decety, Jean and Molenberghs, Pascal (2012) The Neuroscience of Group Membership. *Neuropsychologia*, 50:2114-2120.
 - Polšek, Dora; Jagatic, Tomislav, Ceganec, Maja, Hof, Patrick R. and Šimić, Goran. (2011) Recent developments in neuropathology of autism spectrum

- disorders. *Translational Neuroscience*, 2 (3): 256-264.
- Rose, Steven P.R. (2005) Human Agency in the Neurocentric Age. *EMBO Reports*, 6 (11):1001-1005.
 - Roskies, Adina (2010). How Does Neuroscience Affect Our Conception of Volition? *Annual Review of Neuroscience*, 33:109-130.
 - Spreng, R. Nathan, Mar, Raymond A. and Kim, Alice S. N. (2008) The Common Neural Basis of Autobiographical Memory, Prospection, Navigation, Theory of Mind, and the Default Mode: A Quantitative Meta-analysis. *Journal of Cognitive Neuroscience*, 21(3):489–510.
 - Suminski, AJ; Tkach, DC; Fagg, AH; and Hatsopoulos, NG. (2010). Incorporating Feedback from Multiple Sensory Modalities Enhances Brain-Machine Interface Control. *Journal of Neuroscience*, 30 (50):13777-13787.

Course Goals

- To provide students with a background in theological with apologetics, philosophy of mind, and foundations of neuroscience.
- To enable students to critically evaluate theological, philosophical and neuroscientific scholarship which relates to questions of human nature within a Christian worldview.
- To encourage students to engage in a future of irenic discourse in the wider society on matters of faith, ethics, psychopathology, and social responsibility that is informed by neuroscience.

Course Objectives

Upon completion of this course, students should be able to:

1. Name and describe the major views of the mind-body problem and their relevance to both neuroscience and theology.
2. Name and describe the nature Christian theological positions on human nature and the Imago Dei. And their relevance to neuroscience and philosophy.
3. Identify the neurological systems believed to underlie the religious experience, agency, emotion, and morality.
4. Describe the areas of disagreement and agreement between philosophy, theology, and neuroscience with respect to the soul and to engage in critical reflection on human nature informed by these three disciplines.
5. Provide examples of neuropsychological case studies and syndromes which impact the way we think about the soul, and articulate a theologically informed understanding of these conditions from a Christian worldview.

Course Structure:

The course will contain a variety of in-class formats during scheduled class times. Class meetings will be used for lecture, seminars, case studies, viewing of video material, guest speakers, discussion, and group presentations. The course will be divided into three sections:

- I. Theological and Philosophical Foundations
- II. Neuroscientific Perspectives
- III. Case Studies and Syndromes

In each section there will be a number of readings which should be read prior to class session in which it is assigned. A review of the major points of the readings will be done during class times. Each class period will have a set of questions which will be provided the period prior and students should come to class ready to discuss their opinions/responses to these questions (these responses may be collected for informal assessment of student progress and engagement). Sections are designed to examine the question of human nature from one of the disciplinary perspectives, with the final section designed to critically examine the practical interplay between the disciplines on the nature of the soul.

Science/Psychology/Faith Issues:

While a variety of frameworks exist within the context of psychology and theology, the process of engaging the material with the Christian worldview will be based on the following:

1. Jesus Christ is the Maker of all that is, seen and unseen.
2. The Holy Spirit actively works to transform, heal and minister to our entire being.
3. While Scripture speaks with a variety of voices on a variety of issues, it was not intended to be read as a scientific text. Therefore, we should neither read it as such nor require it to be a science textbook.
4. Knowledge (or little "t" truth) obtained through the natural and social sciences is part of an ongoing process utilizing probabilistic evaluation of theories and has its own epistemological framework and assumptions. Theoretical deduction and empirical induction as part of a scientific framework are rooted in the empirical observation of Creation.
5. Christians have been given the responsibility to care for and study Creation as part of our worship of our Maker.
6. Christian theology can be either *a priori* or *a posteriori*. Examples of *a priori* theology include the Apostles' and Nicene Creeds. The Wheaton College Statement of Faith is another example. *A priori* theology deals with first order assumptions about the nature of God. *A posteriori* theology involves the testing of theological matters and is, therefore, similar to the science of psychology. Utilizing induction and deduction, truth claims are posited and then evaluated. The principles of reliability and validity apply to both the science of psychology and the science of theology.
7. The nature of the process of engaging Christian faith with psychology varies widely. Specifically, engaging many Biblical and theological subjects occurs with little difficulty in the applied and clinical areas of psychology. The more empirical and biological areas of psychology are rooted more in the *a priori* assumptions of the scientific method and may not yield clearly empirical, or what we might expect to be overtly Christian, hypotheses.
8. Within the context of this class, the development of a Christian worldview and proper understanding of the limits of neuroscience research on understanding the soul will be the primary topic of discussion. Other topics (i.e. evolution) will be addressed only when relevant to this topic.

Class Sessions and Out-of-Class Responsibilities: Class will begin promptly at 8:30am and will end at 10:20am. There will be one 10 minute break during each lecture session and instruction will begin promptly after ten minutes. Students are expected to have read the assigned text and any other readings relevant to the topic(s) to be covered prior to coming to lecture. It is the student's responsibility to be aware of additional information covered in the lectures not found in the readings as well as any changes in the syllabus announced in class. While participation in class discussion is not a part of the grading criteria, it is my experience that students who actively participate in class (i.e. asking questions, engaging the material) generally attain a greater understanding of the material and its relevance. All course related material will be placed online via the Blackboard system which can be accessed via the my.wheaton.edu or blackboard.wheaton.edu portals. Lecture notes, announcements, grades, assignments, and other course materials will be placed online here. Please note that all course related correspondence should be done via the Blackboard email interface.

Academic Dishonesty: Plagiarism and Cheating: In this course, plagiarism and cheating cannot be tolerated. This policy can be found in the Psychology Department's *Student Handbook* which defines plagiarism as the "theft of paragraphs, sentences, phrases or ideas without giving proper credit to the person who originated them" (p. 7). In this course, cheating--that is, representing others' work as your own--is most often committed in the copying of assignments or exam answers. In addition, academic dishonesty may also be committed by sharing this information with another (i.e. allowing a classmate to copy your assignments, etc). Remember that a course grade or even your undergraduate career could be jeopardized by cheating and or plagiarism. Also, please read over the section on Academic Integrity contained in the current *Wheaton College Catalog*. Any student found to have committed academic dishonesty will receive a failing grade of zero (0) for the assignment/exam and may be subject to additional discipline based on the severity of the offense.

Course Grading:

1) DISCUSSION ASSIGNMENTS - 50pts total -There will be ten assignments (5pts each) that will be given during the quad that will need to be completed outside of class time. These assignments are to be completed then brought to the next class period to be used as part of a discussion time. Students must bring 2 copies of their assignment to class (one for submission, one for in-class discussion). Late assignments will have a penalty of 2pts/day.

2) EXAMS - 150pts - Three exams (each worth 50pts) will be given throughout the semester. The format for the first two exams will be a set of take-home essay questions designed to address material covered during the previous section (i.e. material from the first section will not be specifically addressed on the second exam). The final exam will be a set of essay questions that cover the entire term (cumulative) and are designed to address material from all three course sections.

3) ONLINE JOURNAL ENTRIES - 50pts - You will be required to submit five journal entries online (via Blackboard) about your interactions with the readings approximately

every 2-3 weeks. Journal entries will address questions to be addressed in the entry and should show thoughtful reflection on the readings and a developed opinion of how the material should be engaged with the Christian faith. Each entry will be worth 10pts. Specific questions for each journal entries readings will be provided. A grading rubric for the reading is available online.

4) GROUP PROJECT - 50pts - A group project and presentation (3-4 students) that highlights an application of the course will be due the last two weeks of class. Groups will be formed during the fourth week of class and group projects must be approved by the tenth week of class. Example topics include: alternative theological/religious traditions perspectives on the soul/neuroscience, multimedia educational materials for churches, syndromes or case studies not addressed in class. The instructor encourages 'out-of-the-box' thinking on group projects and welcomes all proposals. The project should be in the media/format of the student group's choosing. A final version (25pts) will be due two weeks before the final exam (the second to last week of lecture), and a 20-25 minute group presentations of the project (25pts) will be the last week of class. Signups for presentation times will occur when project materials are due. No extensions for this project materials or presentation will be given.

Grading Scale: 300 Points Total

138-150 = A	117-119 = C+
135-137 = A-	108-116 = C
132-134 = B+	105-107 = C-
123- 131 = B	90-104 = D
120-122 = B-	89 and below = F

INDIVIDUAL DIFFERENCES AND DIVERSITY

As part of its mission statement, the Wheaton College Psychology department is sensitive to issues of culture and diversity in the training of students. We maintain a special concern for those persons who have been marginalized by our society on any basis, including but not limited to race, ethnicity, age, and social class. In this course, concern about individual differences and diversity are addressed during sections of the course where we examine case studies and as an ongoing component of course discussions.

ACCOMODATION FOR STUDENTS WITH LEARNING DISABILITIES:

If you need course adaptations or accommodations due to a diagnosed disability, please contact the Wheaton College Academic and Disabilities Support Office which coordinates services for students with disabilities. Documentation needs to be on file before accommodations can be provided. The Academic and Disabilities Support Coordinator can be contacted at 630-752-5674 or jennifer.nicodem@wheaton.edu.

COURSE SCHEDULE

(Dates for Proposal Purposes Only and Modified for Each Term)

Tuesday	Thursday	Notes
<p><u>January 14</u> <i>Course Overview and Introduction</i> Reading : <i>Course Syllabus</i></p>	<p><u>January 16</u> <i>Theological Conceptualizations of the Soul</i> Readings: <i>Hoekema, Chpt 5</i> <i>Moreland, Chpt 1</i> <i>Coope, Chpt 1</i></p>	
<p><u>January 21</u> <i>Theological Anthropology</i> Readings: <i>Moreland, Chpt 5</i> <i>Brown and Strawn, Chpt 1-2</i></p>	<p><u>January 23</u> Readings: <i>Hefner (2000)</i> <i>Brown and Strawn 3-4</i></p>	Online Journal Entry (OJE) #1 Due
<p><u>January 28</u> Readings: <i>Hoekema, Chpt 11</i> <i>Brown and Strawn 5-7</i></p>	<p><u>January 30</u> Guest Lecturer: <i>Theologian - TBA</i> Readings:</p>	
<p><u>February 4</u> <i>No Class - Faculty Development Day</i></p>	<p><u>February 6</u> <i>Philosophy of Mind: Persons, the Self, and the Soul</i> Readings: <i>Cooper, Chpts 5,10</i> <i>Moreland, Chpts 3,5</i></p>	Groups Formed
<p><u>February 11</u> <i>Philosophy of Mind: Persons, the Self, and the Soul (cont'd)</i> Readings: <i>Hasker (2005)</i> <i>Corcoran (2005)</i></p>	<p><u>February 13</u> <i>Philosophy of Mind: Persons, the Self, and the Soul (Part 3)</i> Readings: <i>Watts (2000)</i> <i>Moreland, Chpt 4</i></p>	Tues: OJE #2 Due Thurs: EXAM #1 Handed Out
<p><u>February 18</u> <i>Embodiment and Emergence</i> Readings: <i>Hall (2010)</i> <i>Brown and Strawn, Chpts 8-10</i></p>	<p><u>February 20</u> Guest Lecturer: <i>Philosopher - TBA</i> Reading: <i>TBA</i></p>	Tues: EXAM #1
<p><u>February 25</u> <i>Critical neuroscience and the rise of Neurophilosophy</i> Readings: <i>Choudhury and Slaby, Chpt 4</i></p>	<p><u>February 27</u> <i>Critical neuroscience and the rise of Neurophilosophy</i> Readings: <i>Choudhury and Slaby, Chpt 14</i></p>	
<p><u>February 3</u> <i>Neural Theory of Mind and Mirror Neurons</i> Readings: <i>Spreng, Mar and Kim (2008)</i> <i>Heyes (2010)</i></p>	<p><u>March 5</u> <i>The Cortical (and Sub-cortical) Self</i> Readings: <i>Moreland, Chpt 5</i> <i>Morrison et al (2012)</i></p>	Tues: OJE #3 Due
SPRING BREAK		

<p><u>March 17</u> <i>Hemispheric Specialization and Consciousness</i> <i>Reading: McGilchrist, Chpt 2,4</i> <i>Moreland, Chpt 2</i></p>	<p><u>March 19</u> <i>Neuromorality and Agency(Part 1)</i> <i>Readings:Moreland, Chpt 6</i> <i>Rose (2005)</i></p>	
<p><u>March 24</u> <i>Neuromorality and Agency(Part 2)</i> <i>Readings: Roskies (2010)</i></p>	<p><u>March 26</u> <i>Guest Lecturer: Neuroscientist - TBA</i> <i>Readings: TBA</i></p>	<p><i>Tues: OJE #4 Due</i> <i>Thurs: Exam #2</i> <i>Handed Out,</i> <i>Group Project</i> <i>Topics Approved</i></p>
<p><u>March 31</u> <i>Neuroscience and Religious Experience</i> <i>Readings: Markham (2007)</i> <i>Video - God on the Brain</i></p>	<p><u>April 2</u> <i>Case Study/Syndrome:</i> <i>Methamphetamine Addiction</i> <i>(Agency/Pharmacology)</i> <i>Reading: Buchman et al (2010)</i> <i>Leben (2011)</i></p>	<p><i>Tues: EXAM #2</i> <i>Due</i></p>
<p><u>April 7</u> <i>Case Study/Syndrome: Brain Tumor and Pedophilia (Embodiment, Agency and Sexuality)</i> <i>Reading: Burns and Swerdlow (2003)</i> <i>Knabb, et al (2009)</i></p>	<p><u>April 9</u> <i>Case Study/Syndrome: Capsulotomy Surgery for OCD (Emotions and Brain Damage)</i> <i>Reading: Csigoa et al (2010)</i> <i>Barber et al (2011)</i></p>	
<p><u>April 14</u> <i>Case Study/Syndrome: Temporal Lobe Epilepsy (Mystical Experiences)</i> <i>Reading: Carranzana and Cheng (2011)</i></p>	<p><u>April 16</u> <i>Case Study/Syndrome: Case Study/Syndrome: Brain-Machine Interface</i> <i>Reading: Lee et al (2009)</i> <i>Suminbski et al (2010)</i></p>	<p><i>Tues: OJE #5 Due</i></p>
<p><u>April 21</u> <i>Case Study/Syndrome: Deep Brain Stimulation for Parkinson's Disease (Volition/Agency)</i> <i>Reading: Bronstein et al (2010)</i> <i>Christen et al (2012)</i></p>	<p><u>April 23</u> <i>Case Study/Syndrome: Autism (Social Interactions)</i> <i>Reading: Polsek et al (2011)</i></p>	<p><i>Thurs: Group</i> <i>Projects Due,</i> <i>Presentation Time</i> <i>Signups</i></p>
<p><u>April 28</u> <i>Group Presentations</i></p>	<p><u>April 30</u> <i>Group Presentations</i></p>	<p><i>EXAM #3 Handed</i> <i>Out on Thurs,</i> <i>4/30</i></p>
<p><i>(FINAL) EXAM #3 Due - TBA</i></p>		

SUMMARY

This course is designed for advanced level undergraduates who have a background in general education courses in Psychology, Christian Thought/Theology and Philosophy. The course will have two foundational sections issues about the nature of theological anthropology and the soul in theology, as well as philosophical positions on the nature of the mind and soul (Section 1), and perspectives on relevant neuroscience research and its limitations (Section 2). Both sections will have relevant guest speakers who will address their own contributions to the discourse. The final section (Section 3) is designed to focus on case studies (e.g. brain tumors, psychopathology) and neuropsychological syndromes (i.e. Autism) to examine practical, 'real-world' relevance of the course question, 'What is the link between the brain and the soul?' Potential award funds would be used pay for off-campus speaker expenses who would also give evening lecture for the broader campus community and general public.