

**APPLICATION FOR ADMISSION INTO PSYCH 331 & PSYCH 332**  
(You may apply to a maximum of two sections)

**Winter, 2010 - Psychology 332 (Laboratory Practice in Brain, Behavior, and Cognitive Science) and  
Psychology 331 (Research Methods in Brain, Behavior, and Cognitive Science)**

**Description and Enrollment Procedures**

***Purpose***

The purpose of this 3-credit course is three-fold: (1) Provide students with opportunities to gain practical laboratory experience by assisting an individual faculty member in the Biopsychology or Cognition and Perception Program with his/her ongoing research. (2) Introduce students to selected general methods used in the field of biopsychology and cognitive neuroscience (brain and behavior and animal behavior). (3) Provide practical knowledge about research design, quantification of behavior, scientific writing, the use of animals in research, and miscellaneous techniques used by biopsychologists and cognitive neuroscientists in laboratory research.

***Prerequisites***

Psychology 230 (Intro. to Biopsychology) and permission of the instructor (some instructors may require Psychology 240 - Intro. to Cognitive Psychology or Psychology 345 - Human Neuropsychology or one further upper level course in Biopsychology; see Description of Lab Sections below). A lab course in Biopsychology is required of students concentrating in 'Biopsychology and Cognitive Science,' leading to the B.S. degree, and therefore, these students will receive priority to register.

***Instructions for Enrollment***

Sections are identified by individual faculty INDI numbers (see below). Each student will be expected to devote approximately 10-12 hours/week in the laboratory to meet course requirements. What the students do during this time will vary depending on the nature of the research in each specific lab. Admission to a lab section is by *permission of that instructor only*. Students should first examine the list of the laboratory sections to be offered in a given Term (see below), decide on what section they want, and then apply for admission using the following procedures. Students are encouraged to apply for a lab section as soon as possible after the enrollment period opens.

***Upper Level Writing Requirement (ULWR)***

All students who want to meet the Methods lab requirement for the Brain, Behavior, and Cognitive Psychology or Psychology concentration, or the Research lab for the Neuroscience concentration, in conjunction with the Psych 332 lab work must elect

Psych 331, a one credit course on Research Methods in Brain, Behavior, and Cognitive Science. Students in Psych 331 will meet together in a common seminar/discussion for 2 hour/week. Work in Psych 331 will include tasks which have been designed to meet the ULWR writing requirement.

**Application Procedures:**

***Note: To be admitted to Psychology 332, a student must first get permission from an individual faculty member to work in his/her lab.***

**Please follow these procedures:**

(1) Fill out an application form (obtained in the Cognition & Perception/Biopsychology Area Office, 4017 East Hall or the Psychology Student Academic Affairs Office, 1343 East Hall.)

(2) Hand in the application form *directly* to the Professor in whose lab you wish to work. If you apply to two labs, the maximum number allowable, hand in a separate form to each Professor, and note this on the application.

(3) After the Professor has reviewed the application he/she may set up an appointment for an interview.

(4) You should contact the professor again before the end of the term in which you submitted an application to learn whether you have been accepted into the section. The professor "accepting" your application will authorize the Psychology Student Academic Affairs Office (1343 East Hall) to issue you an 'override form' allowing you to register for both the lecture section (001) and their specific lab section.

***Grading***

Grades in Psych 332 will be based on a subjective assessment of your performance in the lab (e.g., facility in acquiring specific skills; reliability; industriousness, accuracy and attention to experimental protocols, etc.)

Assignments in Psych 331 are designed to teach you the process of scientific writing and revision. This course has been approved for the Upper Level Writing Requirement. Students that receive a grade of a C- or above automatically receive credit for the ULWR. Failure to complete EVERY stage of the writing project will result in receiving a C- or lower for the course grade and thus no credit for the Upper Level Writing Requirement.

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***Relationship of Psychology 332 to Psychology 422  
(Independent Research)***

For the most part 332 will serve as a prerequisite to 422. That is, the normal sequence by which students will get

Biopsychology lab experience will be to first take 332, and then if further exposure to this type of lab work is desired, to then take 422. Students who obtain additional lab experience via the 422 mechanism will be able to use the 332 plus 422 credits to fulfill the two natural science laboratory course requirement that is part of the concentration program in Biopsychology and Cognitive Science.

**Sections of 332 to be Offered Winter Term, 2010\***

**Sec Type Time Faculty**

428	Lab	Arr	Aldridge
665	Lab	Arr	Aragona
322	Lab	Arr	Becker
340	Lab	Arr	Berridge
542	Lab	Arr	Boland
030	Lab	Arr	Borjigin
579	Lab	Arr	Deldin
132	Lab	Arr	Flagel
458	Lab	Arr	Gehring
436	Lab	Arr	Gerstner
373	Lab	Arr	Lee
529	Lab	Arr	Liberzon
478	Lab	Arr	Maren
008	Lab	Arr	Paulson
473	Lab	Arr	Polk
585	Lab	Arr	Preston
417	Lab	Arr	Reuter-Lorenz
256	Lab	Arr	Robinson
071	Lab	Arr	Sarter
007	Lab	Arr	Seidler
372	Lab	Arr	Seifert
514	Lab	Arr	Shah
670	Lab	Arr	van Anders
005	Lab	Arr	Vazquez
146	Lab	Arr	Woods

\*See below for a description of the kinds of research experiences offered in different sections.

***Description of Lab Sections***

**Section 428 - Wayne Aldridge**

**([jwaynea@umich.edu](mailto:jwaynea@umich.edu), 4443 East Hall, 763-3706)**

*Description:* Our projects involve studies of basal ganglia neuronal activity related to movement and the presentation rewards and conditioned reward cues. Neuronal activity is recorded from animals trained to perform motor tasks or animals performing instinctive movements. In some experiments the effects of dopaminergic drugs are evaluated. Our goals are to understand the communication mechanisms and computational properties of neuronal circuits controlling movement and rewarded behavior.

**Section 665 - B. J. Aragona**

**([aragona@umich.edu](mailto:aragona@umich.edu), 4040 East Hall, 615-7160)**

*Description:* Our lab research focuses on the neural mechanisms of monogamous pair bonding, drug reward, and the interactions between drug reward and social behavior. For pair bonding studies, we use the prairie vole model. Upon mating, members of this species form life long bonds and the formation of this bond is a powerful tool to study how the brain controls behavior that underlies complex social organization. For drug studies, we employ cutting edge measurement technology to measure real-time dopamine signaling in freely moving rats that are being exposed to various drugs of abuse. Finally, for drug/social reward interaction studies, our lab examines how pair bonding changes the brain in ways that protects prairie voles from behavioral take over by addictive drugs. Students will gain experience in behavioral, neuroanatomical, and neurochemical techniques. It is essential that studies are comfortable working with animals to work in this lab.

**Section 322 – J. B. Becker**

**([jbbecker@umich.edu](mailto:jbbecker@umich.edu), 1050 MBNI, 936-3670)**

*Description:* Our lab examines sex differences in and effects of hormones on brain and behavior in laboratory rodents. There are on-going experiments exploring: a) aspects of female sex behavior, b) effects of gonadal hormones on the effect of cocaine on neurochemistry and behavior, c) sex differences and effects of hormones on the motivation to self-administer cocaine; and d) the use of viral vectors to modify gene expression in the brain. Students will work under the supervision of a graduate student or post-doc, and will learn a variety of general laboratory procedures, including handling rats, behavioral testing, giving drug injections, preparation of solutions, small animal surgical procedures, neurochemical methods, and molecular biology.

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**Section 340 - K. C. Berridge**

**([berridge@umich.edu](mailto:berridge@umich.edu), 4038 East Hall, 763-4365)**

*Description:* Our lab research focuses on affective neuroscience and brain mechanisms of reward liking and reward wanting. Our research is relevant to normal emotion and appetite, as well as to addiction. We study neural bases of positive sensory pleasure, such as hedonic hotspots in the brain that generate pleasure 'liking', and the neurotransmitters they use to do it. We also study brain mechanisms of desire and reward learning, as well as of negative disgust and fear. Students will gain experience in behavioral (ethological video analysis, behavioral testing) and brain techniques (microinjections; brain tissue analysis). Most studies involve rats or mice, so it is helpful to be comfortable with animals.

**Section 542 – J. Boland**

**([jeboland@umich.edu](mailto:jeboland@umich.edu), 4428D East Hall, 764-4488)**

*Description:* Students working in this laboratory will learn about the cognitive processes involved in word recognition and sentence comprehension. Students will participate in designing experiments, developing stimuli, collecting data, and interpreting results. We investigate language processing in both spoken and written modalities, using tools such as eye tracking, reading time paradigms, and cross-modal techniques. Students are encouraged to take Psychology 240 (formerly 340, Introduction to Cognitive Psychology) and Linguistics 200, 210, 211, or 212 either before or concurrently with 332.

<http://www-personal.umich.edu/~jeboland>

**Section 030 – J. Borjigin**

**([borjigin@umich.edu](mailto:borjigin@umich.edu) 7629 MedSci II, 763-5453)**

Our lab is pursuing two areas of research. First, we are investigating the basic MECHANISMS OF CIRCADIAN TIME KEEPING, by monitoring melatonin (a hormone secreted from the pineal gland), locomotor activity, heart rate, and body temperature rhythms in the same freely behaving animal under various conditions. Students interested in this project will learn how to collect and analyze circadian rhythm data, perform basic assessment of jet lag adaptation in animal models and the effects of light on the circadian clock. Our second area of research is focused on the MECHANISMS OF NEUROPLASTICITY in adult nerve system. Students interested in this project will learn how to perform quantitative PCR (Q-PCR), in situ hybridization, Western blotting, and immunohistochemistry (IHC) to assess the levels of gene (using Q-PCR and in situ) and protein (using Western blot and IHC) expression in tissues of interest. Specific projects will be discussed during interview.

**Section 579 – P. Deldin**

**([pjdeldin@umich.edu](mailto:pjdeldin@umich.edu), 2255 East Hall, 647-9863)**

*Description:* Our laboratory studies emotional information processing in psychopathological populations utilizing neurophysiological measures. Specifically, the goal of the research is to examine emotional and cognitive (memory, attention, and expectancy) dysfunction in major depressives, schizophrenics and controls. ERP, fMRI and behavioral studies measures will be utilized.

**Section 132 – S. Flagel**

**([sflagel@umich.edu](mailto:sflagel@umich.edu), 2006 MBNI SPC 5720, 615-2995)**

Research in our laboratory focuses generally on individual differences in susceptibility to mental illness. Specifically, we use selectively-bred lines of rats to study addictive behavior and related traits. Ongoing studies are designed to understand both the behavior and underlying brain mechanisms that might render one more susceptible to addiction. Students will gain experience in the areas of neuropsychopharmacology and classical Pavlovian learning mechanisms. Moreover, as part of a larger research group, students will have the opportunity to learn about neuroendocrinology, neuroanatomy, and translational research relevant to psychiatric illness. The procedures routinely used in the laboratory include a number of behavioral techniques such as intravenous drug self-administration, repeated psychostimulant administration (i.e. psychomotor sensitization), Pavlovian conditioning, and tests for impulsive and anxiety-like behavior. In addition, in situ hybridization histochemistry and microarray analysis are used to examine differences in gene expression in the brains of the selectively bred rat lines. Students will have the opportunity to assist with jugular catheterization surgeries, behavioral testing of the animals, cryostat sectioning of brain tissue, and gene expression analysis, among other things.

**Section 458 - W.J. Gehring**

**([wgehring@umich.edu](mailto:wgehring@umich.edu), 4052 East Hall, 763-4381)**

*Description:* Current work in the Human Brain Electrophysiology Laboratory concerns the cognitive and neural basis of executive control processes, the high level cognitive, affective, and motivational processes that govern behavior. The primary methodology is event-related brain potential (ERP) activity recorded from 50 or more scalp electrodes. Students will gain experience in ERP recording, including the application of electrodes and the testing of human subjects. Computer analysis and interpretation of ERP data will involve training with specialized software for electrophysiological data as well as Windows-based word processing and

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graphing programs. Major topics include: (1) medial frontal lobe (anterior cingulate cortex) activity related to error detection and the processing of rewards and penalties, (2) disruptions of brain electrical activity in individuals with psychiatric and neurological disorders, and (3) the development of executive control in children. Specific projects include experiments focusing on error detection in a gambling task and brain activity elicited when participants compete against others.

**Section 436 - G. E. Gerstner**  
**([geger@umich.edu](mailto:geger@umich.edu), B383 Dental Building, 763-7717)**

*Description:* My lab has two foci: (Focus 1) The psychophysiology of chronic temporomandibular (TMD) pain in humans. This NIH-funded study involves neural imaging (fMRI, fcMRI, H-SPECT) of evoked and spontaneous pain in human subjects, and comparing functional central activity with motor behavior, genetic markers, psychological responses to pain and function, and pain testing results. Students would be involved with any of several study components occurring in the dental school (motor behavior assessment, pain testing, psychometric data), on North campus (MRI scanning) or at Domino's Farms (data analysis). (Focus 2) The evolutionary physiology of rhythmic behaviors in mammals. These studies explore how and why behaviors occur at specific rates among different mammalian species. Of interest is understanding why rhythmic behaviors scale with body mass among species subjected to natural selection but not among species where selection pressures have been relaxed. Students would be involved with acquiring and analyzing digitized videos of animal behavior from wild, zoo and domestic species.

**Section 373 - T. Lee**  
**(Contact: Elizabeth Peckham;**  
**[elapoczka@umich.edu](mailto:elapoczka@umich.edu), 4264 East Hall, 763-1162)**

*Description:* Students will work on one of the ongoing projects in the lab with a more senior student. Students interested in circadian rhythms can learn how to collect and analyze data, perform basic circadian assessment experiments and may be involved in experiments examining the effect of timed sustained attention task, neuroendocrine axes, sleep or circadian control of reproduction of a diurnal circadian species, Octodon degus or the nocturnal rat. Specific experiments will be described during the interview. The general areas of current interest are: sex differences in circadian control systems, role of hormones in the effectiveness of social interactions for entrainment, and interaction of the attention and circadian systems. Methodologies include ICC for brain section analysis, dialysis to measure cortisol or

AACh, sleep recording, RIA for hormones, and others, depending upon the project. In addition a separate project is recording and analyzing the development of play, association, dominance and reproductive behaviors in sheep. Some sheep were exposed to excess androgens during pregnancy and we are examining the extent of the behavioral alterations and the development of gendered behavior in both sexes. Some sheep experiments include ICC analysis of brains.

**Section 529 - I. Liberzon**  
**([liberzon@umich.edu](mailto:liberzon@umich.edu), 116 VAMC, 769-7392)**

*Description:* Students will work on one of the ongoing projects described below with a more senior member of the lab. 1) Students interested in neurobiology of stress-related disorders will be involved in projects focusing on vulnerability to psychiatric disorders in pre and postoperative patients. 2) Students interested in neuroimaging of emotions can learn about functional neuroimaging, neuroanatomy of emotions and get involved in data processing and analysis 3) Students interested in the development of animal models of stress and anxiety can learn how to design and carry out behavior and neuroendocrine studies in animals models of anxiety and depression.

**Section 478 - S. Maren**  
**([maren@umich.edu](mailto:maren@umich.edu), 4046 East Hall, 936-6532)**

*Description:* The research in my laboratory is geared towards understanding the neurobiological basis of emotional learning and memory. This sort of memory contributes to disorders of fear and anxiety in humans, such as post-traumatic stress disorder. As a model system for studying emotional learning and memory, I use Pavlovian fear conditioning in rats and mice. Studies in my laboratory focus on the role of the hippocampus and amygdala in this form of learning. We use a number of different techniques including electrophysiological recording of neuronal activity in anesthetized or freely behaving rats, neurotoxic lesions, and reversible inactivation of brain structures. Students will learn a number of techniques including stereotaxic brain surgery, fear conditioning procedures, analysis of fear behavior, and histological techniques for processing neural tissue.

**Section 008 - P. Paulson**  
**([plein@umich.edu](mailto:plein@umich.edu), Bldg 31, Rm 222 VAMC, 845-5472)**

*Description:* Research in our lab focuses on the neural mechanisms of cognitive dysfunction and chronic pain associated with aging, diabetes and addiction using animal models. Current projects in the lab include 1) the effects of exercise on sensory

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processing and the viability of employing exercise as treatment for diseases (i.e., diabetes, fibromyalgia) that produce chronic neuropathic pain and how various drugs used to treat neuropathic pain may be more effective when paired with exercise; 2) the underlying supraspinal mechanisms responsible for age and diabetes-induced changes in cognition using autoradiographic techniques to look at brain activation, receptor density, cell morphology and cell death; and 3) identifying the common and separate neural circuits that mediate chronic pain and drug addiction. Students will gain experience in basic science and laboratory techniques, including but not limited to: animal handling and testing, data entry and management, basic statistics, giving drug injections, small animal surgical procedures, neuroanatomical and neurochemical techniques. All of our studies involve lab rats, so willingness to work with lab animals is necessary.

**Section 473 - T. Polk**  
**([tpolk@umich.edu](mailto:tpolk@umich.edu), 4428E East Hall, 647-6982)**

*Description:* Our lab is currently pursuing two main programs of research. First, we are studying the role of nature and nurture in shaping the neural organization of cognition. We do so using functional MRI to investigate patterns of neural activity in twins and normals. Our second program of research involves developing, implementing, and testing neurally inspired and computationally explicit models of cognitive processes. For more information, see [http://sitemaker.umich.edu/tpolk\\_lab](http://sitemaker.umich.edu/tpolk_lab)

Psychology 331 students in the lab typically are involved in implementing an experiment, helping with literature reviews, and/or running a behavioral experiment using subjects from the undergraduate subject pool.

**Section 585 - S. Preston**  
**([prestos@umich.edu](mailto:prestos@umich.edu), 3040 East Hall, 764-5264)**

*Description:* Research in our laboratory uses an interdisciplinary approach to study the interface between emotion and decision making. There are currently two main lines of research: 1) How do people process the emotions of others and how does this affect the type and amount of help they offer? 2) How do people make decisions about allocating resources like food, money, and material goods? In both of these lines, we try to determine the proximate (what the brain and body are doing) and ultimate (why they exist, how they evolved) bases of these complex behaviors. We use a variety of methods, measuring overt behavior (via computer responses or video coding), personality (via scales or questionnaires), emotion (via self-report and psychophysiology) and brain activity (via PET and

fMRI). We use a team-oriented approach with students working together to complete specified tasks. Everyone must attend a weekly lab meeting and can join one or more teams to work on the arena of research that most interests them including literature searches, IRB approval, protocol development, programming, subject testing, data processing and analysis). Students must be conscientious, hard-working, and commit to two semesters and at least 10 hours per week. For more information, please go to: <http://www-personal.umich.edu/~prestos/Lab/ENLrecruitment.html>

**Section 417 - P. Reuter-Lorenz**  
**([parl@umich.edu](mailto:parl@umich.edu), 4054 East Hall, 764-6577)**

*Description:* Students working in this laboratory will gain experience with techniques used to test human subjects in behavioral experiments designed to understand hemispheric differences in working memory, perception, attention and other aspects of cognitive and/or emotional function. Students may also assist with experiments involving the testing of older adults or the measurement of eye movements. Students are encouraged to take Psychology 240 (formerly 340, Intro. to Cognitive Psychology) and/or Psychology 345 (Human Neuropsychology) either before or concurrently with 332. <http://www.umich.edu/psych/parllab>

**Section 256 - T. E. Robinson**  
**([ter@umich.edu](mailto:ter@umich.edu), 4024 East Hall, 763-4361)**

*Description:* Students will gain experience in the general area of neuropsychopharmacology, especially as related to the mechanism of action of selected drugs of abuse. Ongoing projects are designed to understand the long-term consequences of psychomotor stimulant drugs (e.g., amphetamine, cocaine) on brain and behavior using rats as experimental subjects. The procedures in routine use in the laboratory include behavioral testing under a variety of experimental conditions (including intravenous drug self-administration), stereotaxic surgery for implantation of cannulae in brain, in situ hybridization histochemistry to examine how drugs alter gene expression in the brain, anatomical studies of how drugs change neuronal structure, and routine histological procedures on brain tissue. Students will assist in one of a number of ongoing projects, and are encouraged to take Psychology 436 (Drugs of Abuse, Brain and Behavior) either before or concurrently with 332.

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**Section 071 – M. Sarter**

**([msarter@umich.edu](mailto:msarter@umich.edu); 4032 East Hall, 764-6392)**

Description: Our research focuses generally on brain mechanisms mediating attentional mechanisms and capacities. Specifically, we are studying the regulation and function of the cortical cholinergic input system. Abnormalities in the regulation and integrity of this system contribute to the development of the cognitive symptoms of dementia and schizophrenia. Our present experiments are designed to measure the release of the transmitter acetylcholine in animals performing attention-demanding tasks. Furthermore, we are developing new methods in order to assess the capacity of choline transporters in vivo. Research involves animal models of schizophrenia and dementia to examine the role of dysregulated cortical cholinergic inputs in the manifestation of the cognitive impairments that are characteristic for these disorders. Students will be involved in experiments which employ combinations of sophisticated behavioral, neurochemical, electrophysiological and molecular methods to manipulate or measure cholinergic transmission in the cortex.

**Section 007 – R. Seidler**

**([rseidler@umich.edu](mailto:rseidler@umich.edu), 4428A East Hall / 3060A CCRB, 615-6224)**

Description:

Our laboratory examines human motor control, with a specific emphasis on plasticity of behavior and structure-function relationships. We use both behavioral (movement kinematics, kinetics, electromyography) and neuroimaging (functional and structural MRI) techniques to study how people learn new motor skills, adapt movement to novel environmental contexts, and adapt movements in response to age-related physiological changes. Students will work on one of the ongoing projects in the lab with a more senior student. Current projects include study of how motor skills are transferred between different contexts, the interaction of handedness with skill acquisition, and age-related changes in bimanual task performance and interhemispheric communication.

**Section 372 – C. Seifert**

**([seifert@umich.edu](mailto:seifert@umich.edu), 3042 East Hall, 763-0210)**

Description: This research project involves detailed coding and analysis of digital video recordings. The questions of interest include how physicians organize their encounter with a patient when addressing difficult diagnoses. Students will be involved in careful data analysis of patient-doctor interchanges, so an interest in medical reasoning is required. Tasks include: developing coding schemes, coding videos for specific behaviors, entering and organizing data

in Excel spreadsheets, conducting simple data analysis, and possibly writing research reports. The students will also be given background readings about this research and will discuss the research and relevant literature.

**Section 514 – P. Shah**

**([priiti@umich.edu](mailto:priiti@umich.edu), 2204 East Hall, 615-3745)**

Description: Research in our laboratory centers around working memory (the ability to actively maintain task-relevant information) and executive functions (cognitive mechanisms involved in switching from one task to another, inhibiting irrelevant information or prepotent responses, planning, multitasking, and so on). In particular, we address the extent to which working memory and executive functions can be improved with practice in college students and special populations such as older adults and students with attention-deficit disorder who have impairments in executive functions and working memory. In addition, we attempt to understand more about executive functions and working memory via studies with human participants: For example, in a current project we are examining the encoding, rehearsal, and retrieval of visual and spatial information in working memory. Students will be involved in several aspects of the research, depending on the project they choose, their backgrounds and goals, and their time commitment. Tasks may include some or all of the following: designing studies, developing stimuli, scheduling and testing research participants, entering and organizing data, conducting simple data analysis, and possibly presenting the research. The students will also be given background information about this research and attend lab meetings in which we will discuss the research and relevant literature.

**Section 670 – S. van Anders**

**([smva@umich.edu](mailto:smva@umich.edu), 3028 East Hall)**

Description: Our lab studies human social neuroendocrinology, sexuality, gender/sex and evolution. In addition to bidirectional hormone-behavior associations, we are especially interested in how social behavioral contexts influence hormones. We focus mainly on sexuality, partnering, and nurturance as social contextual variables. Research involves attention to diverse populations, and the development of feminist science/inclusive research practices to conduct this research. Students will work in the lab on one of the ongoing projects with Dr. van Anders and the other lab members; current projects will be described during the interview and some are listed on Dr. van Anders' website (see above). Students will work in a collaborative research environment and gain skills in human social neuroendocrine and sexuality research, including

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questionnaire development, participant testing, critical approaches to current literature, and research design. Given the focus in the lab, students should be 18 yrs or over and comfortable working on topics relating to sexuality and with people from sexual minorities and diverse groups.

Applicants to this section (Section 670) should include brief responses to the following:

1. Please list other courses you have taken that are relevant to Dr. van Anders' research, e.g. courses related to gender/sex, sexuality, social behavior, diversity, etc.
2. If you have another area of concentration or a minor, please indicate it, e.g. gender and health, anthropology, etc.
3. Please describe your level of comfort working with people with diverse sexualities.
4. Please describe how you can contribute positively to a collaborative team environment in the lab.

Please note that you do not need to respond to the application questions #10 or #11.

investigation at our laboratory. The environment of early life care shapes emotional behavior both in humans and rodents. Therefore, an added area covered in all of this research is the interaction with maternal behavior. To learn more about the relationship between early life stressful environment, and its repercussion to the developing fetus Vazquez directs a long term study of mothers who have a high risk of developing depression and their infants. Students gain experience in behavioral, neuroanatomical, and neurochemical techniques. It is essential that students are comfortable working with rodents to work in this lab.

**Section 146 - J. Woods,**

**([jhwoods@umich.edu](mailto:jhwoods@umich.edu), 6322 Med. Sci. I, 764-9133)**

*Description:* Students will gain experience with the following methods: (1) Observational studies on the behavioral effects of psychoactive drugs on unconditional behavior and/or (2) Studies on the effects of drugs on conditioned behaviors. Experiments are conducted in mouse, rat, pigeon or rhesus monkey.

**Section 005 – D. Vazquez**

**([dmvazq@med.umich.edu](mailto:dmvazq@med.umich.edu), 1500 MSRB 1, 764-**

**3223)** Our laboratory is interested in molecular brain mechanisms underlying long-term consequences of stress in developing organisms. The limbic-hypothalamic-pituitary-adrenal axis (LHPA), and brain serotonin systems are areas of focus to explore possible neuronal mechanisms underlying vulnerabilities to mood disorders. Brain elements of these systems are studied at different levels (neuronal circuitry, gene expression, protein expression and function) during normal development, after early life stress and after different pharmacological manipulations. The goal is to understand the neurobiology to elucidate strategies to revert and/or prevent behavioral abnormalities. There is also a body of literature that suggests that physical and emotional stressors may be intimately linked to psychopathology and drug seeking behavior. Several components of the LHPA axis have been identified as important in these processes and are also a source of

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1. *Name:* \_\_\_\_\_  
*Employee ID. No (middle eight digits on front of MCard):* \_\_\_\_\_

2. Year: Sophomore \_\_\_\_\_; Junior \_\_\_\_\_; Senior \_\_\_\_\_

3. *Phone number* where you can be reached: \_\_\_\_\_  
*E-Mail Address:* \_\_\_\_\_

4. *Section requested* (give instructor's name): \_\_\_\_\_  
Are you applying to one other section? \_\_\_\_\_  
IMPORTANT: Rank your choices for lab section if more than one. \_\_\_\_\_

5. *Area of concentration:* \_\_\_\_\_

6. *Overall GPA:* \_\_\_\_\_

7. *Relevant course background:* (Check the courses you have taken, and note any courses in which you will be enrolled concurrently with 332).

- Psych 230 Intro. Biopsych. \_\_\_\_
- Psych 240 Cognitive Psychology \_\_\_\_
- Psych 345 Human Neuropsychology \_\_\_\_
- Psych 400 Biological Rhythms \_\_\_\_
- Psych 430 Comparative Animal Behavior \_\_\_\_
- Psych 432 Reproductive Behavior \_\_\_\_
- Psych 433 Biopsychol. or Motivation \_\_\_\_
- Psych 436 Drugs of Abuse, Brain & Behavior \_\_\_\_
- Psych 338 Primate Social Behavior \_\_\_\_
- Psych 347 Perception \_\_\_\_
- Psych 531 Hormones & Behavior \_\_\_\_

List any other Biopsychology and/or Cognition and Perception courses you have taken in the space below.

List the courses you have taken in the following disciplines.

*Biology:*

*Chemistry:*

*Mathematics and/or Statistics:*

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*Other sciences:*

Answer the next five questions on a separate piece of paper.

8. Briefly describe why you want to take 332, and why you want this particular section.
  
9. Briefly describe your future plans (e.g., career, medical school, graduate school, or other goals), and how you think this course will be important in achieving these goals.
  
10. Do you have any objections to the use of animals in basic research, or do you personally object to working with animals?
  
11. Briefly describe your experience with computers and your knowledge of computer software packages and computer programming.
  
12. What special skills and abilities (e.g., hobbies, personal interests, or experience) do you have that may make you a special asset to the laboratory?

Signature      Date

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1. Name: \_\_\_\_\_  
Employee ID. No (middle eight digits on front of MCard): \_\_\_\_\_

2. Year: Sophomore \_\_\_\_\_; Junior \_\_\_\_\_; Senior \_\_\_\_\_

3. Phone number where you can be reached: \_\_\_\_\_  
E-Mail Address: \_\_\_\_\_

4. Section requested (give instructor's name): \_\_\_\_\_  
Are you applying to one other section? \_\_\_\_\_  
IMPORTANT: Rank your choices for lab section if more than one. \_\_\_\_\_

5. Area of concentration: \_\_\_\_\_

6. Overall GPA: \_\_\_\_\_

7. Relevant course background: (Check the courses you have taken, and note any courses in which you will be enrolled concurrently with 332).

- Psych 230 Intro. Biopsych. \_\_\_\_
- Psych 240 Cognitive Psychology \_\_\_\_
- Psych 345 Human Neuropsychology \_\_\_\_
- Psych 400 Biological Rhythms \_\_\_\_
- Psych 430 Comparative Animal Behavior \_\_\_\_
- Psych 432 Reproductive Behavior \_\_\_\_
- Psych 433 Biopsychology or Motivation \_\_\_\_
- Psych 436 Drugs of Abuse, Brain & Behavior \_\_\_\_
- Psych 338 Primate Social Behavior \_\_\_\_
- Psych 347 Perception \_\_\_\_
- Psych 531 Hormones & Behavior \_\_\_\_

List any other Biopsychology and/or Cognition and Perception courses you have taken in the space below.

List the courses you have taken in the following disciplines.

*Biology:*

*Chemistry:*

*Mathematics and/or Statistics:*

**APPLICATION FOR ADMISSION INTO PSYCH 331 & PSYCH 332**  
**(You may apply to a maximum of two sections)**

*Other sciences:*

Answer the next five questions on a separate piece of paper.

8. Briefly describe why you want to take 332, and why you want this particular section.
  
9. Briefly describe your future plans (e.g., career, medical school, graduate school, or other goals), and how you think this course will be important in achieving these goals.
  
10. Do you have any objections to the use of animals in basic research, or do you personally object to working with animals?
  
11. Briefly describe your experience with computers and your knowledge of computer software packages and computer programming.
  
12. What special skills and abilities (e.g., hobbies, personal interests, or experience) do you have that may make you a special asset to the laboratory?

Signature      Date

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