Syllabus for SRA 231 – Decision Theory and Analysis, Spring 2016
Section 1: T/R 2:30 PM - 3:45 PM
Room: 206 IST Building
Section 2: T/R 11:15 AM - 12:30 PM
Room: 208 IST Building

Instructor
Nick Giacobe, Ph.D.
Lecturer and Research Associate
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Office
102 E Information Sciences and Technology Building

Phone
814-865-8233

Instructor Office Hours
Wednesdays 10am-Noon
or BY APPT

Section 1: Hunter Neal
Section 1: Alyssa Stackpole
Section 1: Aaron Wilson
Section 2: Zach Mullins
Section 2: Madison Oliver

Learning Assistants

Office & Office Hours
CONTACT THROUGH ANGEL
TBD

Pre-Requisites
SRA 111, STAT 200
* Note – These pre-requisites are absolutely required. No exceptions will be made, not even for concurrent registration.

Required Readings:
• Decision Theory, A Brief Introduction, Hansson, (2007) – on ANGEL
• Other readings as assigned on ANGEL

Recommended Readings:
• Structured Analytic Techniques, Heuer & Pherson (2010)

Course Description: SRA 231 is an introductory course on decision theory with a broad focus on the non-technical (non-mathematical) aspects of the theory of decisions relating to security and risk analysis. Behavioral decision theories provide the theoretical core for the course. These theories draw on insights from a diverse set of disciplines, including cognitive and social psychology as well as economics, statistics and philosophy. The course introduces SRA majors to these theoretical models as well as other popular and

1 All email to the instructor regarding this course should be sent through the email communication facility in ANGEL. You may email the instructor or LAs individually or “All Course Faculty” to reach all of us. I am merging the two sections on ANGEL.

Last Revised: 1/12/2016
evolving decision-support systems. Students will explore and debate various decision theory and decision-support methods in order to gain a clear understanding of the strengths and weaknesses of each for use in the field of security and risk analysis. This course will maximize collaborative and action-learning experiences wherever appropriate. Emphasis will be placed on teamwork, group interaction and developing and practicing writing and speaking skills through application of the concepts that define the course.

The goal of the SRA program is to build future leaders in this critical major. We need students who can think quickly and analytically, of course, but we also need students who are aware of the spectrum of IST values: respect for technology, cultures, and the law. This course helps you to become familiar with the vocabulary and skills of the field.

Course Objectives:

INTRODUCTION. Framing the course: Decision Theory – Why this course is relevant. Decision theory as an aid to decision making will introduce: (a) the cognitive, emotional, social and institutional factors that influence judgment and choice, (b) normative (economic) models of rational choice, and (c) how judgment and decision making can be predicted and/or improved through prescriptive aids and models.

Unit 1 Modern Decision Theory. The application, strengths and weaknesses of various theoretical frameworks including, “Normative” decision theory; that is how people “should make decisions,” “Descriptive” decision theory or how people actually make decisions; and “Expected Utility Theory,” i.e., decision-making under risk – based on “probabilistic beliefs.” Students will conduct and produce written analysis, engage in debate and participate in exercises and problem-solving sessions utilizing the various decision theoretic methods and decision support tools introduced throughout the course.

Unit 2 Methods of Analysis: To understand the fundamentals of decision theory and understand the role of personal bias in the analytical/decision making process; students will be introduced to decision support models, decision tools, aids and associated terminology. Methods of Analysis lectures, assignments and exercises will be integrated throughout the course.

Unit 3 Capstone Exercise: Putting theory to practice is the objective of Unit 3. During this segment, students acting in teams will assume roles within a governing agency to analyze solve and brief a contemporary problem utilizing the theory, methods and tools taught in Units 1 & 2.

Individual and Team Efforts: To develop an understanding of the methods used by decision-makers students will be expected to conduct individual research and writing assignments both in and out of the classroom and to participate in in-class group discussion, exercises, as well as analysis and problem solving sessions.

Communication with the Instructor: Please communicate with me about this class via ANGEL mail to “All Course Faculty”. ALL student e-mails to the Instructor or LA must utilize ANGEL. That is the only way I can communicate with you electronically concerning course details and regarding student grades. I will NOT respond (with details) to Gmail or even your PSU email account. You can also meet with me during posted office hours, before or after class or via appointment.

Reading Assignments: You can expect a short reading assignment for each class day. Complete all required reading to get ready for class discussions, assignments and exercises. You will be expected to keep up. There is a lot of material to cover and we will not have a lot of time to retrace old ground. Most reading assignments should take no more than 30 minutes to complete.

Evaluation Methods and Assessment: This course will incorporate collaborative and action-learning experiences wherever appropriate. Emphasis will be placed on developing and practicing writing skills, creating complex visual representations and models and improving speaking skills through application of the concepts that define the course. Rubrics will be provided for the more extensive individual and group assignments.

Last Revised: 1/12/2016
You will be assessed on your comprehension of decision theory and analysis knowledge by your ability to put the course material into practice. To achieve this goal, three types of practical application assignments have been created all specifically tailored to the task.

1. **In-Class and Practice Problems (PP)** are in-class and sometimes homework related that are short and focused on specific course content. PP’s are worth 25-50 points each.

2. **Writing Assignments (WA)** are somewhat expanded, but still relatively brief examples of analytic writing work whose focus is to reinforce succinct writing using active voice. The other aspect emphasized through the WA is the Peer Review (PR) process. Peer Reviews are conducted on all written assignments. For an expanded explanation of the PR process see the Course Style Guidance in the Student Support Folder in ANGEL. All WAs are worth 100 points each.

3. The End-of-Course **Capstone Exercise** has been designed to place the student in the role of the analyst to solve a contemporary issue of security and risk. The capstone places emphasis on: analytics through effective team-work, collaboration and communication. Each team is centered on a specific set of analytic tasks for whose associated evidence they must assemble, sort, conduct sense-making and resolve. Two final products result: the Agency Report & Agency Final Brief; both are team assignments. The Capstone is worth 250 points (out of 1000 possible points for the course).

**Course Submissions in ANGEL:** When you submit assignments via an ANGEL drop box, please ensure your name is on both the assignment and as part of the file-name. Example: ”SmithJ_HW1.doc” would be John Smith’s filename for Take Home Assignment 1. If I don't have all of this information, this makes it difficult for me to know who has submitted the work. If you are submitting a team assignment, the names of all team members must be on the paper, and the file name should be: ”TeamFBI_WK1Rpt.doc.” This is the best way to get credit for your work!

*Please see the Course Style Guide in ANGEL for additional details.*

**Grading Scale:**

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<thead>
<tr>
<th>Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93 - 100%</td>
<td>A</td>
</tr>
<tr>
<td>90 - 92.99%</td>
<td>A-</td>
</tr>
<tr>
<td>87 - 89.99%</td>
<td>B+</td>
</tr>
<tr>
<td>83 - 85.99%</td>
<td>B</td>
</tr>
<tr>
<td>80 - 82.99%</td>
<td>B-</td>
</tr>
<tr>
<td>77 - 79.99%</td>
<td>C+</td>
</tr>
<tr>
<td>70 - 76.99%</td>
<td>C</td>
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<tr>
<td>60 - 69.99%</td>
<td>D</td>
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<tr>
<td>Below 60%</td>
<td>F</td>
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Grading will be assessed with points in the following categories:

- **Class Attendance & Participation (3 x 50 points per unit):** 150 Points
- **Homework and Practice Problems (25-50 points each):** 450 Points
- **Writing Assignments (25-100 points each):** 400 Points
- **Capstone:** 500 Points

**Total:** 1500 Points

**Late Work:** In order to get FULL CREDIT for any Take-Home Assignment or Writing Assignment it MUST be completed and turned in by the due date prescribed in the course schedule. Late assignments (WAs, HWs, and in-class assignments) will be assessed a penalty of 10% per 24-hour period that the assignment is late. Full credit opportunity will be given for late assignments only if they are in conjunction with an excused absence. Please ensure you keep track of ALL due dates so that you don’t fall behind.

Last Revised: 1/12/2016
For the team-project portion of the course, late work will have a negative impact on the instructor’s evaluation of the team. Your teammates will likely reflect negatively on you for late work on their peer evaluations of you.

Course Policies

Electronic Device Policy

Use of electronic devices during class is limited to class assignments. Once class begins, please close your laptop and stow your other electronic devices to show your classmates (and me) your attention. There are times when computer use during class is both encouraged and necessary to complete in-class exercises or assignments. Note taking via laptop is always approved. However, electronic distractions during class from unrelated web surfing, email, social media, texting, ringing cell phones and other devices hamper the learning process. Please set your electronic devices to “off”, “vibrate” or some other silent setting and stow them during class; I will endeavor to do the same.

Attendance Policy

Attendance is required for this course. Role will be taken each day. We will utilize name cards to take role. Students are responsible to pick up their name card and initial it for each class day. Name cards that are not picked up will result in the student being noted as absent. Excused absences will be granted for good reason, but you must request the excuse via ANGEL Email (All Course Faculty) before the end of the day of absence. As you can see by the grading criteria below the difference between attending class and not is considerable. There is a limit to the number of classes one can miss and still receive a passing grade in this course. Attendance will be combined with effort and participation in class. Unexcused absences will result in deductions from this portion of the class grade.

The following graduated scale will be used for the semester:

- From one (1) to three (3) un-excused absences – student will lose five (5) points each;
- Four (4) to seven (7) un-excused absences – student will lose seven (7) points each;
- Eight (8) to ten (10) non-excused absences – student will lose ten (10) points each;
- Eleven (11) or more unexcused absences will be cause for failure.

Academic Integrity

The College of IST is committed to maintaining academic integrity in this and all other courses it offers. IST takes academic integrity matters seriously. Academic integrity - scholarship free of fraud and deception - is an important educational objective of Penn State. Academic dishonesty can lead to a failing grade or referral to the Office of Student Conduct. Academic dishonesty includes, but is not limited to:

- Cheating
- Plagiarism
- Fabrication of information or citations
- Facilitating acts of academic dishonesty by others
- Unauthorized prior possession of examinations
- Submitting the work of another person or work previously used without informing the instructor and securing written approval
- Tampering with the academic work of other students
In cases where academic integrity is questioned, Penn State's policy on academic integrity requires that the instructor give the student notice of the charge as well as the recommended sanction. Procedures allow the student to accept or contest the charge through discussions with the instructor. If a student chooses to contest, the case will then be managed by the respective College or Campus Academic Integrity Committee. If a disciplinary sanction also is recommended, the case will be referred to the Office of Student Conduct.

All Penn State colleges abide by this Penn State policy, but review procedures vary by college when academic dishonesty is suspected. Information about Penn State's academic integrity policy and college review procedures is included in the information students receive upon enrolling in a course.

Additionally, students enrolled at Penn State are expected to act with civility and personal integrity; respect other students' dignity, rights, and property; and help create and maintain an environment in which all can succeed through the fruits of their own efforts. An environment of academic integrity is requisite to respect for self and others, and a civil community.

For more information on academic integrity at IST and Penn State, please visit:

- http://ist.psu.edu/students/academic_integrity
- https://handbook.psu.edu/content/academic-integrity
- http://www.psu.edu/oue/aappm/G-9-academic-integrity.html
- http://studentaffairs.psu.edu/conduct/

Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For every incident when a penalty of any kind is assessed, a report must be filed.

Accommodating Disabilities

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Office for Disability Services (ODS) Web site provides contact information for every Penn State campus: http://equity.psu.edu/ods/disability-coordinator. For further information, please visit the Office for Disability Services Web site: http://equity.psu.edu/ods.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: http://equity.psu.edu/ods/guidelines. If the documentation supports your request for reasonable accommodations, your campus’s disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

**Americans with Disabilities Act:** The College of IST welcomes persons with disabilities to all of its classes, programs, and events. If you need accommodations, or have questions about access to buildings where IST activities are held, please contact us in advance of your participation or visit. If you need assistance during a class, program, or event, please contact the member of our staff or faculty in charge. Access to IST courses should be arranged by contacting the Office of Human Resources, 332 Information Sciences and Technology Building, (814) 865-8949.

Nondiscrimination and Harassment

The University is committed to equal access to programs, facilities, admission and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of
discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University’s educational mission, and will not be tolerated.

This policy shall not be construed to restrict academic freedom at the University, nor shall it be to restrict constitutionally protected expression.

Conduct prohibited by this policy may also violate Title IX and Title VII, and other applicable federal and state law. Dr. Kenneth Lehrman III, Vice Provost for Affirmative Action is the Title IX Coordinator. Deputy Title IX Coordinators include Danny Shaha, Senior Director of the Office of Student Conduct and Kim Lantz Yoder, Equity Officer, Penn State College of Medicine. Additional information about how to contact these individuals, or to otherwise pursue or report a violation of this Policy, please see Office of Multicultural Affairs, 332 Information Sciences and Technology Building, University Park, PA 16802; Tel 814-865-0077 or to the Office of Affirmative Action, 328 Boucke Building, University Park, PA 16802-5901; Telephone: 814-865-4700/V, 814-863-1150/TTY. For reference to the full policy: http://guru.psu.edu/policies/ad85.html

University-Wide Emergencies

In the case of a University-wide emergency, please refer to official university communication channels for information regarding campus closures and cancelations. For more general information about the emergency situation, please refer to: http://news.psu.edu. You can also follow Penn State on Twitter http://twitter.com/penn_state and on Facebook at http://www.facebook.com/pennstate for up-to-the minute information during emergencies.

PSU Alerts service is available at http://psualerts.psu.edu. This is a service designed to alert the Penn State community via text messages to cell phones when situations arise on campus that affect the ability of the campus - students, faculty and staff - to function normally.
Class Schedule – The course will roughly follow the schedule below. See the detailed “Class Schedule” document in ANGEL as the schedule may be modified from time-to-time.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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| 1    | Tues 1/12: Course Overview  
Thurs 1/14: Introduction to Decision Theory |
| 2    | Tues 1/19: The Writing Element  
Thurs 1/21: Decision Tables |
| 3    | Tues 1/26: Expected Utility  
Thurs 1/28: The Peer Review Process |
| 4    | Tues 2/2: Decision Strategies  
Thurs 2/4: Orthodox Theory of Risk |
| 5    | Tues 2/9: Critical Thinking  
Thurs 2/11: Tips on Analytic Writing |
| 6    | Tues 2/16: Naturalistic Decision Making  
Thurs 2/18: Introducing Analysis |
| 7    | Tues 2/23: Analysis of Competing Hypotheses (ACH)  
Thurs 2/25: PARC ACH Tutorial |
| 8    | Tues 3/1: Introduction to Analyst Notebook (Time Line)  
Thurs 3/5: Introduction to Analyst Notebook (Association Charts) |
| Spring Break | Tues 3/8: NO CLASS!  
Thurs 3/10: NO CLASS! |
Thurs 3/17: Information Extraction and Weighting (IEW) |
| 10   | Tues 3/22: Applying Analytic Techniques – Passenger 10-A  
Thurs 3/24: Rules for the Exercise/Capstone |
| 11   | Tues 3/29 & Thurs 3/31: Capstone |
| 12   | Tues 4/5 & Thurs 4/7: Capstone |
| 13   | Tues 4/12 & Thurs 4/14: Capstone |
| 14   | Tues 4/19 & Thurs 4/21: Capstone: Final Report and PPT Prep |
| 15   | Tues 4/26 & Thurs 4/28: Capstone: Presentations |