SDSM&T Responsible Conduct of Research Plan

INTRODUCTION

Aristotle stated "Law is reason free from emotion." In stark contrast, research is not investigation free from ethics, rather research is best described as investigation *guided* by reason and ethics. In today's competitive academic environment it could also be stated that research is investigation guided by reason and ethics and *enforced* by law.

In 2009, Section 7009 of the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science (COMPETES) Act (42 U.S.C. 1862) was amended to include provisions for the training of undergraduate and graduate students in the responsible conduct of research as well as requirements for the mentoring of post-doctorate researchers who are receiving support from the National Science Foundation.

All proposals submitted after January 4, 2010 will require certification that a responsible conduct of research plan (RCRP) exists and is being enforced on a campus.

The following outlines a multi-phase plan for ensuring that students are educated about the ethics related to their research. Underlying the plan is the belief that mere certification of effort alone is not sufficient to meet the spirit of the America COMPETES Act. As an institution we are committed to advancing the understanding of our students and encouraging the development of their reasoning and analysis skills and we also believe that Research and Academics are intermingled and should not be separated when it comes to instruction on ethics.

The Phases included in this Plan are designed to allow the integration of this research requirement into the academics of the School. Our commitment to educating students on the responsible conduct of research is already well and firmly established – as part of our curriculum for matriculation for many of our undergraduate programs (see (SDSMT Course Catalog page 103, 193, 241, 263, 284, 302, 313) students are required to complete courses in their sophomore and senior year that directly address professionalism and engineering ethics and/or attend classes that are specifically designed to incorporate an understanding of the ethics involved in their particular field.

Note that along with multiple phases of the Plan there are also two parts to the Plan: part one addresses the teaching of ethics to undergraduate and graduate students and part two addresses the mentoring of post-doctorates.

PART I: Training Undergraduate and Graduate Students

Phase One – Compliance/Tracking & Development

DEVELOP a means to extract from the current HR/Accounting/Enrollment systems the names of all students receiving funding from NSF-sponsored research and require them to (at a minimum) go through the NIH certification for Human Subjects Research AND participate in a on-line training program until such time as the course mentioned above is created.

{IN PROCESS}

CREATE/APPROVE – Course specifically geared to educating undergraduate and graduate students that:

1) Gives examples of the historical reasons why ethical training in research is important
2) Assist students in identifying where ethical conflicts/violations may arise
3) Provide students with examples of multiple Ethical codes as a means of addressing action steps to resolve the ethical conflict
4) Reflect on the possible ethical issues that could arise as a result of or as part of their research

{COMPLETED: IENG 479/579 Research Ethics, 1 Cr. Approved by Curriculum Committee on November 5, 2009}

Recognizing that courses are not created or offered overnight, in this phase we will also:
DEVELOP a series of campus-wide lectures to engage students and faculty in discussions about ethical issues impacting research

{Speaker on Institutional Review Boards and Research Ethics – February 16, 2010}

Phase Two – Implementing Education & Training

DESIGN/OFFER - the Course mentioned above as a 1 credit class for undergraduates and graduates

{COMPLETED: TM 675 Ethics and Professionalism for Technology Managers offered Spring 2010 – this course is delivered in hybrid mode, meaning that all sessions of the course are video recorded. The first section of the course is titled "Research Ethics" and the recordings of these sessions will be offered as the self-paced course IENG 479/579, which can be taken in any semester by students from any Regental Institution, listed in Phase One of the plan. The class is re-recorded and updated every even year Spring semester. The course was taught by Jennifer Karlin, PhD, of the Industrial Engineering Department and L. Eric James II, JD MS, Director of the Office of Sponsored Programs in Research Affairs.}

INFORM advisors of students (using the list created above) of the need to have the student participate in the class.

{ON GOING}

CONTINUE to offer the on-line training and educational series to raise awareness of the issue
{ON GOING}

EXAMINE the possibility of making the ethics class a mandatory graduation requirement at least for graduate students by WORKING WITH department heads and graduate programs to ensure that an ethical component is included in the degree requirements for their students under the guidance of the PROVOST.
{IN PROCESS}

Phase Three – Future Recommendations

The research needs of the campus are changing and evolving quite rapidly as the research portfolio continues to grow. Research thrusts have been adopted, and the infrastructure needed to support the 4 thrusts are being assessed and plans are developing to determine areas of expansion and revision. Attention will need to be paid to the development of the graduation requirements recommended in Phase Two as well as any other further additions that may be needed in order to sustain the ethical training of undergraduate and graduate researchers on campus.

{Research Thrusts:

- Deep Underground Science & Engineering
- Energy and the Environment
- Materials and Manufacturing
- Science, Technology, Engineering & Mathematics (STEM) Education}

{RECOMMENDATION: STEM Ed involves the assessment and development of best learning practices in STEM and as such often requires Human Subjects review and approval by an Institutional Review Board. While the volume of these proposals remains low in the current year, it takes several years to develop an Office of Research Integrity that could support an IRB for the Campus. An ORI could also serve as the tracking/implementation office for the RCR Plan and also contribute to the campus by participating in the Judicial Process and on the Ethics Board. We therefore recommend that an ORI be created under the Vice President for Research in the next two to 3 years}

PART II: Mentoring of Post-Doctorates

Along with our obligation to educate undergraduate and graduate researchers, the School of Mines is also committed to providing mentorship to post-doctoral staff and all faculty members. In the 2009/2010 academic year the faculty development components for campus were revised with an eye to also fostering the development of post-doctorate researchers. We recognize that mentorship and development are two separate issues but like our belief that Research and Academics and inextricably intertwined, we believe that mentorship and development are likewise entangled in the same Gordian Knot.

Phase One - Compliance/Tracking Aspect

INFORM professors and research staff of available resources and requirements for complying with the America COMPETES Act and the important goal of mentoring and development of young faculty and post-doctorate researchers

IDENTIFY proposals that contain post-doctoral researchers

{COMPLETED – OSP identifies such proposals as they are being developed and sends the information to the Department Head or Research Center Director as part of the proposal submission process}

REVISE the current signature page required at the end of the proposal submission process to clearly outline all their role and responsibilities for guiding the post-doctoral researcher in this important part of their initial career

{IN PROCESS}

DEVELOP a sample for research faculty to use for describing the mentoring process on campus that could be included as part of their proposals

{IN PROCESS}

Phase Two - Mentoring/Faculty Development System

CREATE a series of faculty development lectures open to all faculty and research post-doctorates designed to inform them of a variety of information relevant to their career and their professional advancement especially in the area of responsible conduct of research.

{COMPLETED}

Phase Three – Future Recommendations

Continue to review and enhance the faculty development process on campus. Currently the faculty model rests on three pillars – Teaching, Service and Research. Recognizing that as the research portfolio expands on campus that a functionally defined "research faculty" track may develop as well and that the needs of a research-focused faculty member may be different than a traditional model faculty member.

Research Ethics
IENG 479 / 579

Class Mode: Self-paced (DVDs of all sessions are available from the reserve desk at the library)

Instructors: Dr. Karlin and Prof. James

Email:	Jennifer.Karlin@sdsmt.edu	Eric.James@sdsmt.edu
Office:	CM 320	MI 235
Phone:	605-355-3467	605-394-1205
Fax:	605-394-2484	605-394-2484
Office Hours:	by appointment	by appointment

Text: Readings linked to the course web page.

Catalog Description: This course introduces students the ethical and professional issues involved in performing research. Topics include: human and animal subjects, research review boards, fiscal responsibilities and audits, and dealing with research teams.

Grading:

Paper	60 %
Homework(s)	40 %

90 -100%	A
80 - 89%	B
70 - 79%	C

Grades less than C available on request.

Students with special needs or requiring special accommodations should contact the instructor and/or the campus ADA coordinator, Jolie McCoy, at 394-1924 at the ***earliest*** *opportunity.*

Course Schedule

Session One

Topics: Introduction to the Course
Frameworks
Administrivia

Sessions: Two through Five

Preparation:

- **Read**: Pimple, K.D. 2002. "Six domains of research ethics: A heuristic framework for the responsible conduct of research." Science and Engineering Ethics 8:191-205 (available free online at http://poynter.indiana.edu/see-kdp1.pdf)
- **Contemplate**: the activities going on around you in your professional or personal life; could any of them be viewed as a "research activity"? If so, what ethical issues or constraints do you see (or not see) that are underlying or supporting the activity.

Homework One:

Complete the human and animal subjects training online at http://cme.cancer.gov/clinicaltrials/learning/humanparticipant-protections.asp. The site does require you register, but registration is free and the NCI's privacy policy is on their web site. You will have the option of printing a certificate of completion upon completing the course. Submit a copy of this certificate to receive credit for completing the homework.

Homework Two (For 579 students only):

1) MMR and the Lancet story: http://www.msnbc.msn.com/id/35197332/ns/health-mental_health and http://news.bbc.co.uk/2/hi/health/8483865.stm
These articles discuss the MMR inoculation and its possible link to autism in children. At the end it mentioned that the initial study sample was chosen by the researcher from those children attending his child's birthday party. A protocol for this study should have outlined the methodology for selecting the sample as well as the way in which the confidentiality of the test subjects would be assured. What other components may have been in this protocol (name and describe two)? If you were formulating a protocol to conduct research on this topic what are some of the areas that you would want to address (name and tell why for at least two)?

2) Find a similar article, video segment or news blog – it does not need to be one where possible research misconduct has occurred – it can be one about someone doing research on X or Y. Think about what you know about the ethical conduct of research in your field. Name and describe two components of a research protocol that would address the way in which you ethically would go about conducting this sort of research.

Paper:

Choose two research ethics dilemmas: one that is documented (print, online, or video) and one based off of your own life experience. Students are encouraged to base the life experience dilemma off their current research; if the student's current research does not have a current ethical dilemma, students are encouraged to think about where a dilemma might arise. For the documented dilemma, you are welcome to choose any research ethics situation for which an appropriate citation can be provided. Using the cited situation, listed resources, and additional sources, discuss:

- What happened?

- Why is this an ethical issue?
- How could this situation have been avoided and/or remediated?
- What can other researchers learn from this situation?

For the your experience situation, discuss:

- What happened?
- Why is this an ethical issue?
- How could this situation have been avoided and/or remediated?
- What can other researchers learn from this situation?

Finally, compare and contrast the two dilemmas, including a discussion of what each situation could have learned from the other.

Some Additional References (a starting place for further search):

- Gunsalus, C.K. 1998. "Preventing the need for whistleblowing: Practical advice for university administrators." Science and Engineering Ethics 4:75-94 (available free online at http://poynter.indiana.edu/see-ckg2.pdf)
- Williams-Jones, B. Holm, S. 2005. "A University Wide Model for the Ethical Review of Human Subjects Research" Research Ethics Review 1(2): 39-44. (available free online at http://genethics.ca/personal/cardiffmodel.pdf)
- National Academies of Science (1995): On Being a Scientist: Responsible Conduct in Research
- Normile, Dennis. 2001. Japanese Fraud Highlights Media-Driven Research Ethic. *Science*, Vol. 291 (Jan. 5):34-35. (also a possible dilemma for the paper assignment)
- Sieber, Joan E., and Barbara Stanley. 1988. Ethical and Professional Dimensions of Socially Sensitive Research. American Psychologist, 43(4):49-55.
- Ethics and Professionalism: What Does a Resident Need to Learn? Goold SD and Stern D. American Journal of Bioethics, 6(4):9-17, July-August 2006.

Other Helpful Information

Course Web Site…The course web site is available at karlin.sdsmt.edu. The password to access the "schedule and links" pages is available from the instructors.

Submitting Assignments…Homeworks and papers may be submitted to either of the instructors as an email attachment. Make sure your name is on your submitted work; your name should be in the document itself for electronically submitted work. Also include the email address to which you would like feedback and your grade for the assignment sent.

Accessing Electronic Library Resources…Journal databases containing many articles in full text, such as ProQuest, are available online through the university library. Access these resources at http://library.sdsmt.edu/247.htm. You may need to log in to access some of these resources. If so, the username is the library bar code on your student ID card and your initial password is your last name.

Incompletes…Students must complete a course within one month of the final exam date of the course. Courses completed after that time but before the end of the next semester will be docked one letter grade. Courses not completed by the end of the following semester will have to be retaken. Grades will remain as I. Students may request exceptions for extenuating circumstances.

Required Intellectual Diversity Statement…Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment or their personal opinion or conduct should contact the dean of the college which offers the class to initiate a review of the evaluation.

LAST	FIRST	MIDDLE	ID #	MAJOR
Messer	Wyatt	Anthony	1820515	AA
Borchard	Victoria	Denise	1653954	CEE
Cass	Brent	James	1822100	CEE
Collins	Kenneth	Gene	1084878	CEE
Hurd	Cameron	Wade	1268710	CEE
Kemnitz	Brian	Allan	1666406	CEE
Kliewer	James	Ross	1651553	CEE
Rausch	Peter	Paul	1524950	CEE
Richards	Keegan	Michael Douglas	1638074	CEE
Skjervem	Caleb	Howard	1671842	CEE
Troastle	Kyle	S	1613731	CEE
Hammock	Clayton	Bryce	1664457	CENG
Jerke	Amber	Christine	1631497	CHE
Swenson	Tyler	Neal	1627653	CHE
Lu	Jonathan	Nu	1271200	CSC
Paul	Tyler	James	1725498	CSC
Stucky	Colby	Leigh	1065051	CSC
Patten	Jonathan	Daniel	1275281	EE
Fischer	Michael	Jerome	1625705	GEOE
McKaskey	Jonathan	Dennis Roger George	1306038	GEOE
Smith	Gary	Ryan	1650503	GEOE
Treloar	Kyle	Vincent	1239070	GEOE
Jetson	Melissa	Kay	1034854	GEOL-AGEO
Dannenbring	Scot	Eric	1640141	GEOL-ESS
Apelseth	Espen	Alexander	1831763	IENG
Davis	Brian	Scott	1614179	IENG
Donegan	Kendall	Rae	1678407	IENG
East	Eric	Michael	1529543	IENG
Hermanson	Samuel	Garrison	1622565	IENG
Hotovec	Madilyn	Jo	1752436	IENG
Kovash	Bethany	Kae	1756189	IENG
Laughlin	Kimberly	Maria	1678453	IENG
Ling	Jeffrey	Lee	1662487	IENG
Porubensky	Ryan	Michael	1289945	IENG
Wheeler	Lucas	Andrew	1003680	IENG
Wiley	Logan	Michael	1652782	IENG
Hill	Bretton	Tyler	1009411	IS-BUS
Moore	Elizabeth	Brandee	1655315	IS-BUS
Anderson	Karl	David	1844840	IS-HLTH
Holzer	Adrian	Nicole	1618184	IS-HLTH
Kennedy	Colleen	M	1073067	IS-HLTH
Aristeo	Aaron	Michael	1664024	ME
Crompton	Robert	Tyler	1639876	ME
Davis	Jacob	Clarence	1628365	ME
Fedor	Robert	Thomas	1660365	ME
Ford	Andrew	Theodore Huchthausen	1632650	ME
Hawkes	Benjamin	Daniel	1020961	ME
Heaton	Jesse	Walter	1655267	ME
Jensen	Jonas	Hauge	1668127	ME
Rames	Aaron	Lee	1679123	ME
Reitzel	Elias	John	1512251	ME
Stalcup	Tyler	Thomas	1273682	ME
Wegner	Mark	Eugene	1590380	ME
Baker	Anastasia	Melendez	1407607	MET
Marshall	Jay	Eugene	1753478	MET
Russo	Jeffrey	Dennis	1534091	MET
Barth	Tyler	Lynn	1828102	MINE
Holt	Ryan	Thomas	1271957	MINE
Klabenes	Jacinta	Rose	1844549	MINE
Marcus	Zachary	Parker	1654019	MINE
Marowelli	Tyler	James	1752724	MINE
Miller	Bryant	Andrew	1672653	MINE
Ross	Karen	Marie	1845241	MINE
Vreugdenhil	Austin	Lewis	1751648	MINE

Name	ID	MS	PhD	Department	
Doorenbos, Zachary	1269069		1	CBE	ok
Abdulghani, Zuhair Redha	1269890		1	MES	
Alghamdi, Mohammed Nasser	1270238		1	MES	
Hedin, Nyle James	1047645		1	MES	
~~*West, Jeff David*~~	~~1266497~~		~~1~~	~~Nano~~	ok
Meyer, Jonathan	1895419	1		ATM	ok
Phillips, Lisa Marie	1893955	1		Atm	ok
Stauffer, Phillip Andrew	1894214	1		Atm	ok
Upadhayay, Sikchya	1899118	1		ATM	ok
~~Danisch, Christopher~~	~~1023853~~	~~1~~		~~BME~~	?
William, Kirsten Marie	1037025	1		BME	ok
Anderson, Joshua James	1494541	1		CEE	ok
Bertram, Brady	1001594	1		CEE	ok
Lambert, Jason	1062855	1		CEE	ok
Malladi, Yellari M. Kumari	1836516	1		CEE	ok
Ramachandran, Ragunath	1895480	1		CEE	ok
Sampica, Benjamin	1640143	1		CEE	ok
Sanaboyina, Netaji	1894775	1		CEE	ok
Wiesner, Brady	1003785	1		CEE	ok
Kunreddy, Venkat Reddy	1854006	1		CHE	ok
Opoku, Michael Kwabena	1892043	1		CHE	ok
Pinkelman, Rebecca	1827769	1		CHE	ok
Anderson, Jackson Wade	1026646	1		CM	ok
Chadaga, Anoop	1897987	1		EE	
Hamer, Rayburn Chase	1886648	1		Geo/Geol	
Sanovia, James	1265605	1		Geo/Geol	
Tuffour, Peprah Martin	1853868	1		Geo/Geol	
Van Beek, Jason Keith	1039526	1		Geol	
Kilzer, Adam	1899358	1		ME	
Lekkala, Venkata Satya Sunitha Devi	1858744	1		ME	
Hansen, Dane	1271234	1		MES	ok
Mishra, Srujan	1858183	1		MES	ok
Nesheim, Robert	1269334	1		MES	ok
Toth, Natalie Grace	1891092	1		Pale	
Welsh, Edward Thomas	1638173	1		Pale	
Harrell, Terry Lynn	1657996	1		Paleo	
Bhushan, Raunaq	1267546	1		TM-on site	