

CHE 391 (Forensic Science Research)
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Meeting Times: F2-4

Research is an important aspect of your education. It helps solidify knowledge already learned, is a good preparation for graduate school and provides a means for you to get involved in the forensic science field professionally either through presentations at scientific meetings or publications in peer reviewed journals. It can help contribute to the advancement of the field. As Paul Kirk once wrote many years ago, a body of research dedicated to the field of criminalistics is necessary for the field of criminalistics to be a profession rather than a technical skill.

Your undergraduate research experience is in four parts. You have already completed the first part by writing a research proposal. The second part will require you to implement your research design which depending on the success of your data may require modification. Modification of the design should be expected for most projects. The third part of your research will deal with the interpretation and analysis of your data. This is necessary to provide meaning to your results and often requires statistical analysis. The fourth part is the summarization of your research in a manuscript and either an oral presentation (seminar requirement for Chemistry and Biochemistry majors; an option for GE and Biology majors) or poster presentation (available only to GE or Biology majors). The final manuscript is to be written in the format utilized by the *Journal of Forensic Science (JFS)* (see Policy and Procedures Manual for the Forensic Science Program). Manuscripts accepted for publication in *JFS* are generally in accordance with the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*. The timetable for your research is as follows:

1. *Writing of proposal* – Fall Semester, Junior Year in either CHE 300 (Technical Information) or BIO 350 (Junior Colloquium).
2. *Experimental Design and Interpretation/Analysis* – Spring Semester, Junior Year and Fall Semester, Senior Year. Registration is under CHE 391 (fall) and CHE 392 (spring).
3. *Manuscript and Presentation* – Spring Semester, Senior Year in either CHE 352 or BIO 354.

Research meetings are not a class. They are designed to give students and faculty the opportunity to discuss each other's research and to make suggestions. This is also the best time to ask questions about your research. These meetings are for the benefit of the entire group. By the second week of the semester, you are to meet with your research advisor to design a plan for your project for the duration of the semester. You are responsible for meeting the goals agreed upon by you and your advisor. During your initial meeting with your advisor, a list of research materials and supplies needed for the duration of the semester should be generated. Please give your list of supplies to Dr. Quarino by **September 5**. Please include item number and vendor for each material requested.

Prior to each research meeting, you are responsible to turn in a one-page research update to your research advisor on your research activities since the last research meeting. This is due no later than 12 noon on Fridays when research meetings are scheduled. This is not meant to be punitive or to give the student more work, but a way to ensure your advisor that you are progressing in your research. You will be graded on your progress and your work ethic. Students will also be asked during each research meeting about the progress of their research.

Each student is required to keep a laboratory notebook that will document all experiments and results. All entries in the notebook should be properly dated using the forensic science course's format. The notebook will also serve as a journal for the documentation of all research activities. Students should leave their notebooks in a designated area in one of the research laboratories when not being used. Spot checks of notebooks will be made by research advisors during the semester.

Each research student will be assigned a designated area where they can keep supplies, solutions, etc. Janine Kishbaugh will assign each student a location. If you would like a forensic workbox, also see Janine. It is important that all research students be considerate of other students. With that said, students are responsible for ensuring that research areas are maintained and that supplies are properly kept in their designated location. When you notice that something is almost empty or running low, please notify Janine. Do not wait until something is completely finished to tell us. When making solutions the container must be properly labeled using the NFPA rating system. A list of the ratings can be found on the t drive. If you are using a chemical that is not on the list, please notify Janine and look up the rating via the manufacturer's website. If you are unsure of how to determine a solution's NFPA rating, please ask Janine or Dr. Quarino for help. The Forensic Science Program maintains a database of all supplies and chemicals on the campus web. It can be located on the t drive under the *jmperna* folder. Part of your final grade will be based on Laboratory Citizenship.

Part of being a good laboratory citizen is to make sure you clean out all your research samples at the end of the semester, if you do not need them in the future. If you need to keep samples, please mark the container or rack with the word **SAVED** and initial and date. Refrigerators, freezers, and other storage areas will be checked prior to the submittal of a final grade.

Every research student will have access to all laboratories housing forensic science research materials. Dr. Quarino will submit the names of all forensic research students to security during the first week of the semester along with the room numbers of the designated laboratories.

Research meetings will be held 13 times on the following days: August 29, September 5, September 12, September 19, September 26, October 10, October 17, October 24, October 31, November 7, November 14, November 21, and December 5. Beginning with the September 12 meeting, students will make 20-minute presentations updating the group on their research. Students are expected to show data (e.g. overheads and hand-outs) and to provide interpretation and future study. Each student is required to give 3 presentations during the semester. Presentation guidelines are attached to this syllabus.

Your final grade will be based on the following:

Weekly research reports/Research Progress and Work Ethic	40%
Three Presentations	30%
Laboratory Notebook	20%
Laboratory Citizenship	10%

Guidelines for Projection of Presentations

1. Dark background and light text give good contrast and show up well in a darkened room. Avoid color combinations such as red and blue, yellow and green, etc.
2. Times New Roman is the recommended font style.
3. Do not use a font below 24 pt.
4. Limit a frame to a single idea or point.
5. Do not crowd the frame. Limit the number of text lines per frame to a maximum of seven.
6. Use simple graphs and illustrations with a minimum of captions. Avoid using thin lines, dots, dashes, or other specialty lines unless they are very bold and black.
7. Do not read off slide.

Guidelines for Format of Seminar Presentation

Each presentation should follow the following outline:

1. Title slide.
2. Goals, objectives, and significance of study. If your goals and objectives change during the course of the study they should be stated in the appropriate presentation.
3. In your first presentation each semester, provide a history of previous work in the subject area and how the presented paper hopes to contribute to the body of knowledge in the subject area.
4. Methods used to date.
5. Data and data analysis (including statistics) to date.
DO NOT PRESENT TABULATED DATA, Use graphs or charts when possible. Tables may be necessary for showing some statistical results such as summarizations of significance testing.
6. Conclusions to date.
7. In your final presentation during your second semester, you should state all final conclusions and whether your goals and objectives were met. Also, statements as to future research and consideration should be given.

Your grade for each presentation will be determined by the faculty present and based on the following factors:

Knowledge of material	25%
Format, style, speaking ability	25%
Professionalism (including appearance and manner of speech)	25%
Ability to answer questions	25%