Proposal for a B.S. Degree in Forensic Science for Russell Sage College
to be implemented beginning Fall 2001.
Approved by the Division of The Sciences 1/16/01

The Forensic Science B.S. degree program, built upon the foundation of our ACS-certified Chemistry program as well as our division's long-standing rapport with the New York State Police Forensics Lab in Albany, would be an excellent option for Russell Sage students. Graduates of the program would compete favorably for technical positions in any state or local forensics laboratory. The program would also be suitable for students interested in secondary education in biology (there is room in the senior year for courses preparing the student to move into our M.A.T. program), law school, or graduate study in forensic biology or chemistry. With some additional coursework, the program would also be suitable for pre-med students. Students who drop out of the Physical Therapy major would make the transition relatively easily, given that their coursework in the first two years is similar. Also, women students at Sage JCA enrolled in the A.S. program in Science may consider moving into this RSC program. There would be no direct connection between this program and the existing M.S. in Forensic Psychology (identification, evaluation, and treatment of problematic behaviors, attitudes, and psychological states--which has little to do with gathering and chemical analysis of physical evidence from a crime or accident scene).

The Bachelor's Degree program in Forensic Science contains a solid foundation in the sciences of biology, chemistry and physics, some intermediate-level study of chemical analysis techniques and instrumentation, some courses in criminology and investigation/evidence, a junior-level professional course, and at least six credit hours of internship in a forensics lab. The competence of a student who graduates with this degree will depend strongly on the quality of the internship experience: Sage has access to the New York State Police facility--one of the highest-quality internship sites available in New York State.

TV programs such as "CSI: Crime Scene Investigation", "The New Detectives", "The Profiler" and "The X Files" have popularized careers in this area, and there are going to be many job openings over the long term in New York State due to recent changes to the DNA Database Law (there will be a ten-fold increase in the number of convicted offenders who are annually required to provide a DNA sample for analysis and entry into the State Databank).

The program consists of 74-78 credit hours of required course work. Of these, 57 credit hours form the core in Biology, Chemistry, Criminal Justice, and Forensic Science; 11 credit hours are support courses in Physics and Statistics; and 6-10 credit hours are electives in Biology/Chemistry. 10 credits of the above are in Professional courses; the remainder are Liberal Arts.

Core:

- BIO 104-105 Introductory Biology with laboratory (8 credits L.)
- CHM 111-112 Introductory Chemistry with laboratory (8 credits L.)
- CHM 201-202 Organic Chemistry I & II with laboratory (8 credits L.)
- CHM 205 Chemical Analysis (3 credits L.)
- CHM 303 Biochemistry I (3 credits L.)
- CHM 302 Instrumental Analysis (4 credits L.) (writing-intensive course in the major)
- BIO 405 Molecular Genetics (4 credits L.)
- CRM 111 Criminal Justice Functions and Processes (3 credits L.)
- CRM 266 Criminal Law and Procedure (3 credits P.)
- CRM 353 Evidence (3 credits P.)
- BIO/CHM 340 Introduction to Forensic Science with lab (4 credits P.)
- BIO/CHM 307 Internship in Forensic Science (6 credits P.)

Support Courses:

- PHY 101-102 OR PHY 107-108 Introductory Physics with laboratory (8 credits L.)
MAT 113 OR PSY 207 OR SOC 207 Statistics (3 credits L.) (Note: BIO 164 Biostatistics does not satisfy gen ed quantitative analysis requirement, and so would not double count and is not a viable option here.)

Electives:
6-10 additional credit hours in Biology/Chemistry according to career objective, by advisement.
- BIO 206 Genetics with laboratory (4 credits L.)
- BIO 208 Microbiology with laboratory (4 credits L.)
- BIO 220 Cell Biology with laboratory (4 credits L.)
- BIO 358 Proseminar (3 credits L.)
- CHM 406 Advanced Laboratory Methods in Organic Chemistry (1 credit L.)
- BIO 401 OR CHM 407-408 Senior Research Project (3-6 credits L.)

Recommended General Education Courses to support this major:
- Technology-Intensive requirement: Computer Literacy CSI 101
- Humanities/Arts requirement: Introductory Spanish (rather than American Sign Language)

Proposed schedule/course sequence for the B.S. in Forensic Science at Russell Sage College:

<table>
<thead>
<tr>
<th>First-year students</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>CHM 111, with lab (Natural Sci gen ed)</td>
<td>CHM 112, with lab</td>
</tr>
<tr>
<td>BIO 104, with lab (Natural Sci gen ed)</td>
<td>BIO 105, with lab</td>
</tr>
<tr>
<td>ITD 120 (gen ed core)</td>
<td>Statistics (gen ed quant reas)</td>
</tr>
<tr>
<td>ENG 101 (gen ed core)</td>
<td>CSI 101 (gen ed intensive)</td>
</tr>
<tr>
<td>CRM 111 (Social Sci gen ed)</td>
<td>Humanities (gen ed)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second-year students</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>PHY 101 OR 107, with lab</td>
<td>PHY 102 or 108, with lab</td>
</tr>
<tr>
<td>CHM 201, with lab</td>
<td>CHM 202, with lab</td>
</tr>
<tr>
<td>CHM 205</td>
<td>CHM 302, with lab (gen ed intensive) OR BIO 405, with lab</td>
</tr>
<tr>
<td>CRM 266 OR CRM 353</td>
<td>Humanities/Language (gen ed)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third-year students</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>BIO/CHM 340 Intro to Forensic Science</td>
<td>BIO 405, with lab</td>
</tr>
<tr>
<td>CHM 303 OR CHM 307, with lab (gen ed intensive)</td>
<td>OR CHM 302, with lab (gen ed intensive)</td>
</tr>
<tr>
<td>CRM 353 OR CRM 266</td>
<td>BIO/CHM 307 Internship</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
</tr>
</tbody>
</table>

Summer between third and fourth years: additional time to finish or start the internship.

<table>
<thead>
<tr>
<th>Fourth-year students</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>BIO/CHM 307 Internship</td>
<td>Elective (project)</td>
</tr>
<tr>
<td>Elective (project or seminar)</td>
<td>ITD 420 (gen ed core)</td>
</tr>
</tbody>
</table>

In order for students with various points of entry to complete this program within four years of traditional day classes, it will be necessary for most of the courses to be offered each year. Four courses can continue to be offered every other year, as long as their sequencing is correct: CHM 302 and BIO 405 will have to be offered in alternating spring terms; CRM 266 and CRM 353 will
have to be offered in alternating fall terms. When the program begins in Fall 2001, first-year students will not need these courses but we should consider admitting transfer students who would start the program at the second-year level and require CRM 353. The following is suggested, given that CHM 302 is being offered Spring 2001, BIO 405 was already offered Spring 2000, and CRM 353 was not offered Fall 2000:

- CHM 302 Spring 2003, 2005, 2007, etc.
- BIO 405 Spring 2002, 2004, 2006, etc.
- CRM 353 Fall 2001, 2003, 2005, etc.
- CRM 266 Fall 2002, 2004, 2006, etc.

**Relationship to other programs at Sage:**

This proposed program is both contemporary and interdisciplinary, and meets the objectives of The Sage Colleges’ "Agenda for Excellence" which states that "by the year 2000, each academic division will offer at least one new or substantially revised academic program that addresses contemporary student interests and needs." The program is based on the core coursework of both the Chemistry and Biology undergraduate majors, and courses in laboratory techniques; this presents a blending of the two disciplines which will allow for multiple points of entry, and which will give graduates many options in the job market besides working as a technician in a forensics laboratory (for example: the same course preparation is needed for employment at the Electron Microscopy Lab at the Stratton V.A. Hospital, and at the Cytotechnology Lab at Albany Medical Center). We expect that our program would initially attract 3-5 first-year students (about equal to the number we bring in each year as first-year Chemistry majors), and perhaps 6-10 internal transfers each year (such as existing Health Sciences majors looking to change their major). Once the program is firmly established, it will likely attract as many external transfers at the sophomore and junior level as our current Biology major due to the common curriculum found in the first two years of study. Our A.S. program in Science (Physical Science Emphasis) at Sage JCA will be another source of potential students at the junior level.

The Forensic Science B.S. program will be challenging, and is thus not intended as a “fall-back” major for weak students (we do not expect it to compete directly with existing programs). However, there are some students who can be retained if this major is an option for them: students who (for whatever reason) are unable or unwilling to continue into the upper division of a Health Sciences major or a Natural Sciences major; these will be attracted to a program in Chemistry or Biology that is “application-oriented” and makes efficient use of the coursework they have already completed. The program would also serve as a “track” for students who would like to complete an undergraduate degree in the natural sciences, and then go on to master's level study for teaching at the high-school level.

**Internal Evaluation:**
Evaluation of this program will concentrate on outcomes of the internship experiences, and on the periodic review of the major by the Program Review Committee. The internships will be evaluated and monitored by a Coordinator appointed from within the full-time faculty of the Division of The Sciences. Internship hosts will be required to provide written evaluation of the student participants and their level of preparation for internship in forensic science.

**External Evaluation:**
The attached memoranda from the office of the Director of the State Police Crime Laboratory in Albany testify to the fact that many job openings exist, and many more will open up in the near future. Informal discussions have been held between Division faculty and investigators on staff at the State Police Laboratory; this program would be well-received.

There are only five other institutions in the area (within a five-hour drive) and 22 institutions total in the U.S. that currently offer a B.S. in Forensic Science or Forensic Chemistry (Reddy's Forensic Home Page http://haven.ios.com/~nyrc/new05.htm) with these as the local competitors: University of New Haven, John Jay College of Criminal Justice, West Chester University (Pennsylvania), Ohio University, and Buffalo State College. Our proposed program is most-similar to the one at
Buffalo State College (their internship list includes the Albany State Police Crime Lab, which is in our backyard).

Resources Needs:
While existing equipment, supplies, courses and faculty load would be used for the most part, there will be some modest startup costs for this program beginning with approximately $6000 during the 2002-2003 fiscal year (two adjuncts and the initial library resources), and approximately $3000 biannually thereafter (one adjunct every other year, plus some supplies and library resources).

1. CRM 266 Criminal Law, does not appear on Sage's multi-year schedule of courses since it is brought in by most of our Criminal Justice transfer students. Beginning with Fall 2002, we need this course to be taught at Sage every other year for students who start the program here, and would require a statement from the administration confirming funding for an adjunct for this purpose.

2. We need to hire an adjunct to co-teach the first offering of BIO/CHM 340 in Fall 2002. We have designed the Intro to Forensic Science course to be team taught, and to include a significant component in Histology, an upper level biology course that we used to offer. Since we already have faculty expertise in physiology and histology, we only need to hire one adjunct to cover the areas of physical evidence and laboratory techniques while one faculty member in the Division undergoes retraining, so that the BIO/CHM 340 course can be team-taught on load by full-time faculty by Fall 2003.

3. Books and journal articles will be needed to support the Intro to Forensic Science course. Lynne King and Kingsley Greene have both pointed out the fact that there are no existing library collections in our region from which we can borrow. By Fall 2002, we should have at least an on-line or paper subscription to the Journal of Forensic Sciences and a small number of books and videos on hand, costing less than $2000 during the 2002-2003 fiscal year (we will stay in line with Kingsley Greene's initial estimate given when the Concept Paper was approved by APC one year ago). Ongoing costs will depend on how the research components of the 340 and 307 courses develop, and on the number of students we can recruit into the program. It should be pointed out that the internet resources in this field are growing.

4. During Fall 2002, some lecture and laboratory supplies will be needed to supplement what we already have in the Histology area. Through savings brought about by reductions in our intro science courses, most of these costs can be covered within the existing supplies budget. Student fees will cover the costs of some consumables, and the field trip costs.

5. The Division would like to eventually purchase a Gas Chromatograph/Mass Spectrometer, to support the Forensic Science program and to update the programs in Chemistry, Biochemistry and Biology. The instrument, costing about $50,000, has become standard equipment in industrial and government laboratories for identification and characterization of chemical compounds: e.g. complex organic molecules, proteins, peptides and oligonucleotides. The instrument is essential for such varied purposes as development and quality control in pharmaceuticals; detection of harmful compounds in drinking water such as MTBE, PCB's and pesticides; forensic investigation; and interplanetary surface and atmospheric analyses. We are pleased to report that during the Summer of 2000, the Grants Planning Committee at The Sage Colleges approved a funding plan for the equipment needs of this program and the existing programs in the Division. The funds are not coming out of the budget: through a combination of left-over monies from existing grant programs, and funds solicited by the Development Office, Sage is setting aside matching funds (a little each year) to support applications for grants for capital equipment purchase in the sciences. Within three to six years, there should be enough matching-funds money accumulated to support a NSF grant application for a GC/MS. The rate at which the money accumulates depends on the individual donors, who are actively being sought. In fact, a new Trustee, Chester J. Opalka has expertise in science equipment and is expected to be an advocate for us in raising funds.
Undergraduate (RSC, SEC, SJCA) New Course Proposal Form

Please attach a course outline. The outline should include:
1. course title and description.
2. suggested/required texts and materials.
3. learning outcomes expected for students.
4. approximate schedule of topic coverage.
5. evaluation/grading description
6. outside commitments (e.g. practica, tutorials)

Send the completed form and attachments to the office of the Vice President for Academic Affairs, Plum Hall, Troy campus.

Date    12/28/00
Division    Sciences
Discipline/Program    Forensic Science
Course title    Introduction to Forensic Science
Proposal author    F. Vozzo    Credit hours  4
Course prefix    BIO/CHM    Course level    300
Course category:    Professional
Format(s) in which the course will normally be taught:    Regular semester
Grading by:    Letter
Offered:    each fall

Does this course replace an existing course?    no
Which requirements does this course satisfy?    major, elective
Will this course be required in other programs?    no
Will this course be cross-listed with other prefixes?    yes
Please specify which program/prefix    BIO/CHM

Please check if applicable:
Would your new course represent a change
___ in a course that is prerequisite to one in another discipline?
___ in a service course required of majors in another discipline?
_x_ in requirements that affects service course enrollments?
___ in your division’s contribution to the upkeep or
development of shared resources?
___ adversely affecting other courses or programs?

If any of the above have been checked, the author must inform the affected program’s
coordinator/chair and secure her/his signature below. Failure to do so will significantly delay
ADC/BDC action.

________________________________________________________________________
Please print name.    Please sign name.    Please date.

Course description (for catalog)

This course introduces the student to the forensic science profession. Forensic scientists work in a laboratory setting, where they apply the principles and techniques of scientific analysis to the study of crime scene or accident scene evidence. Course topics include techniques used for the identification and analysis of body fluids, hair, fibers, plant
material, latent fingerprints, voiceprints, firearms, documents, and photographs. Laboratory experiments emphasize histology, DNA analysis, wet chemical techniques, microscopy, and the use of spectroscopic instrumentation. Some field trips are included (there is a fee for these).

Prerequisites: BIO 104, CHM 202, CHM 205, CRM 111

Methods of instruction and evaluation
Lectures, laboratory exercises, field trips, term paper.

Describe how the course fits into the program(s) of the discipline and the division (rationale).
The course ties together several courses in the natural sciences and criminal justice, and shows how these topics come together in forensic science. The course also lays the foundation for the six-credit internship in a forensic laboratory. The scheduled field trips will include visits to potential internship sites.

Anticipated class size 6-10 Any max or min? max=12

Cost to students, other than texts: some laboratory supplies; field trip fee

Library requirements: will students be required to use library resources?
(If "no", please proceed to technology section) yes
Which library will students primarily use? Troy

Please consult the liaison librarian for your division or program before answering the next two questions.
(If the RSC or SEC General Education programs do not apply to the course, skip)

Is this course to be designated as: writing intensive? no tech. intensive? no cross-cultural? no

Explain briefly any plans to include works (scholarship) by/about women.
The Coalition of Women's Colleges has identified forensic science as an up and coming field for women. Contributions to the field by women will be highlighted where appropriate.

Record of approval (acknowledging that the correct procedures have been followed):

Program Coordinator Division Chair

Page 6
Course Outline BIO/CHM 340 Introduction to Forensic Science (with lab)  
Fall 2002 Russell Sage College

Prerequisites: BIO 104, CHM 202, CHM 205, CRM 111

Outcome statements: by the end of the course, students should be

1. familiar with the functions performed by forensic scientists in the forensic laboratory.
2. able to distinguish amongst the microscopic structures of animal and plant tissues, including the tissues from many of the systems of the human body.
3. familiar with the practices and procedures used in the processing of physical evidence from a crime or accident scene, including the identification of toxic substances.
4. familiar with the modern instrumentation used by forensic scientists, and have had hands-on experience in its operation.

Texts (preliminary selections):


Lectures: Two days per week, 90 minute sessions
Laboratory: One day per week, three hours (some sessions will be field trips)

Requirements/grading (preliminary):

- Two exams- one midterm and a final 50%
- Homework and laboratory reports 20%
- Term Paper (library research) 30%

Topic coverage (preliminary):

<table>
<thead>
<tr>
<th>week</th>
<th>topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Forensic Science laboratory</td>
</tr>
<tr>
<td>2-6</td>
<td>Histology; techniques in serological and biological analysis</td>
</tr>
<tr>
<td>7</td>
<td>Toxicology</td>
</tr>
<tr>
<td>8-10</td>
<td>Physical Evidence (fingerprints, voiceprints, firearms, photographs, etc.)</td>
</tr>
<tr>
<td>11-12</td>
<td>Special instrumentation</td>
</tr>
<tr>
<td>13</td>
<td>Current topics</td>
</tr>
</tbody>
</table>

The Spirit of Learning: Statement on Appropriate Conduct on Campus

All members of The Sage Colleges Community are expected to conduct themselves in a way which respects the learning environment. Thus, Sage has the right to remove any student from a classroom, other academic area, or program at any time if the student's behavior is contrary to the spirit of learning of the program in any way. Violent, disruptive, harassing, or intimidating behavior is not tolerated in the classroom or any other place on campus. Any student whose conduct disrupts a class or other learning environment may be required to leave the premises immediately and be subjected to disciplinary or legal action.

Policy on Academic Honesty

Academic dishonesty in any of its forms, including cheating, plagiarism, misuse of SageNet, and failure to comply with guidelines for the conduct of human research, will not be tolerated at The Sage Colleges. A full statement of the policy on plagiarism, cheating and academic dishonesty is
available in any of the academic division offices, in the Russell Sage College Dean and Graduate Dean offices (Troy) and Sage Evening College Dean and Sage JCA Dean office (Albany).

**Americans with Disabilities Act**

Russell Sage College is committed to assisting students with disabilities, as defined by the Americans with Disabilities Act. A student who wishes to request academic adjustment under the Americans with Disabilities Act must make a request in writing to The Sage Colleges’ Coordinator of Services for Students With Disabilities:

Coordinator, Disability Services  
Rathbone Hall, Albany Campus  
The Sage Colleges  
40 New Scotland Avenue  
Albany, NY 12208  
(518) 292-1764

The Sage Colleges reserves the right to require medical verification of the handicap causing the student to seek adjustment of academic conditions.

Notification of any request for academic accommodation should be sent to the Coordinator of Services for Students With Disabilities immediately upon registration for the course. The Coordinator of Services for Students With Disabilities will notify the instructor of the request, discuss the options, if any, which can meet the request, agree on the acceptable adjustments, and notify the student seeking adjustment within 10 working days. A final report of the discussion and resolutions shall be filed by the Coordinator of Services for Students With Disabilities no later than five working days after agreement with all parties has been reached.

**Liaison Librarian's Report**  

Sage Libraries’ holdings in forensic sciences are very limited. While forensic psychology is a new graduate program at Sage, no new funds have been provided for collection in this subject area, and there is little material available to supplement a forensic science program. Likewise, materials supporting the legal studies program are limited, with an emphasis on legal citation resources, such as WestLaw.

A search of selected headings in the Sage Libraries’ online catalog shows very limited holdings:

<table>
<thead>
<tr>
<th>Subject Headings</th>
<th>Number of titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forensic Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Forensic Scientists</td>
<td>0</td>
</tr>
<tr>
<td>Chemistry, Forensic</td>
<td>0</td>
</tr>
<tr>
<td>Evidence, Expert</td>
<td>17 (primarily psychological topics)</td>
</tr>
<tr>
<td>Crime Laboratories</td>
<td>5</td>
</tr>
<tr>
<td>Science and Law</td>
<td>29 (3 titles published since 1990)</td>
</tr>
<tr>
<td>Forensic Toxicology</td>
<td>3</td>
</tr>
<tr>
<td>Forensic Biochemistry</td>
<td>0</td>
</tr>
<tr>
<td>Forensic Medicine</td>
<td>29 (4 titles published since 1990)</td>
</tr>
<tr>
<td>DNA Fingerprinting</td>
<td>1</td>
</tr>
<tr>
<td>Arson Investigation</td>
<td>1</td>
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</tbody>
</table>

To begin a program in forensic science, it would be necessary to invest in the development of a core collection initially, with additional titles added gradually each year.
Estimated costs:
Initial collection development
  Books, Circulating $2500
Assumes a selection of titles from the approximately 50 books published each year in the forensic sciences, over the last five years, at about $50 per title
  Reference Materials 1500
Including at least one primary index to journal articles such as Forensic Science Abstracts, $993/yr.
  Videos 500
Evidence collecting, lab techniques, etc.
  Journals 2700
Selected examples:
  Accident Reconstruction Journal, $39/yr
  Journal of Forensic Sciences, $129/yr.
  The Expert and the Law, $75/yr.
  Forensic Accident Investigation, $95/yr.
  Forensic Examiner, $100/yr.
  Forensic Science International, $1,748/yr.
  Science and Justice, $230/yr.
  Scientific Evidence, $175/yr.
  Wound Ballistics Review, $40/yr.
Total Initial Costs: $7200
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Ongoing, annual costs:
  Books, Circulating $750
  Reference Materials 1200
  Videos 250
  Journals 2700
Total Ongoing costs: $4900/year

L. King 12/99