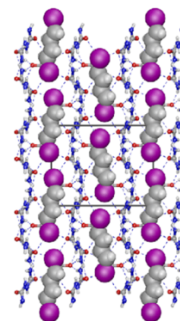






**SYRACUSE UNIVERSITY
PROJECT ADVANCE
UNDERGRADUATE
RESEARCH (URP)
2021
TEACHER ORIENTATION**



	Morning	Afternoon
Monday (7/12)	<p>8:30AM –10:00AM: Welcome and Program Orientation SUPA Staff and Faculty</p> <p>10:30AM– 11:15AM Information Session <i>Dr. Nappa-Carroll</i></p> <p>11:30 AM - 12:00: Introductions and backgrounds of participants and leaders (Prof. <i>James T. Spencer</i> (<i>host</i>), <i>SU Chemistry Department</i> and <i>FNSSI</i>).</p>	
Tuesday (7/13)		<p>1:00 PM – 2:30: Library resources: Mendeleev and Library Resources (<i>Patrick Williams</i>, Humanities Librarian, Digital and Open Scholarship Lead, SU Library)</p>
Wednesday (7/14)	<p>8:30-9:30 SUPA Registration with Emily Beck.</p>	<p>1:00 – 2:30: Pseudoscience (<i>Prof</i> <i>Donald Siegel, Professor Emeritus of</i> <i>Earth Sciences, Syracuse University</i>)</p>
Thursday (7/15)	<p>9:00 AM – 10:30: Meet with SUPA URP instructors: <i>Dr. Matt</i> <i>Schuchman (North Clarkstown HS)</i>, <i>Hannah O’Leary (Rachel Carson</i> <i>HS)</i>, <i>Elizabeth Stephens (Mahopac</i> <i>HS)</i> [<u>Assignment</u>: Look over syllabus and prepare questions for Friday. AM session]</p> <p>10:45 – 11:45 PM: Blackboard and Administrative SUPA Items (<i>Melanie Nappa-Carroll</i>).</p>	

Friday (7/16)	<p>10:15 – Noon: Brainstorming and Issues (<i>Profs. Spencer and Sponsler</i>):</p> <ul style="list-style-type: none"> • Identify problems for discussion: <ul style="list-style-type: none"> ○ Publishing and IP, mentors, project scope, etc. ○ Share resources with the group ○ How to trouble shooting problems ○ Student journaling ○ Future Meeting topics and presentations ○ Materials (what would be useful) ○ Other issues. 	<p>1:00 – 2:00 PM: (2) wrap-up and final questions (<i>Drs. Nappa-Carroll, Spencer and Sponsler</i>).</p>
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<p>Prof. James T. Spencer, Ph.D., Syracuse University</p> 	<p>Professor. PhD. Iowa State University 1984, Postdoctoral Fellow, University of Virginia 1984-1986; Chancellor's Citation for Excellence, Distinguished Achievement Award in Boron Science, 2000; Laura J. and L. Douglas Meredith Professor and Exec. Dir., Forensic and National Security Sciences Institute (FNSSI). Research directed toward aspects of sensor development, main group cluster chemistry, including nanoscale molecular systems, photochemistry, Forensic Science and solid-state chemistry.</p>	<p>Laura J. and L. Douglas Meredith Professor, Professor of Chemistry, Founding Exec. Dir. FNSSI, SUPA Faculty Chem/Forensic Sci./URP Program Coordinator, Department of Chemistry, Syracuse University Syracuse, New York 13244 (315) 443-3436 (Office) (315) 443-4070 (FAX) (315) 420-5233 (cell) jtspence@syr.edu</p> <p>Web: https://thecollege.syr.edu/people/faculty/spencer-james-t/</p>
<p>Prof. Michael Sponsler, Ph.D., Syracuse University</p> 	<p>Professor. Organic and Organometallic Chemistry, Ph.D. California Institute of Technology, 1987, Postdoctoral Fellow, Univ. California Berkeley. Director of Curricular Programs, Forensic and National Security Sciences Institute (FNSSI). Research is aimed toward conducting polymers, components for molecular electronic devices, new types of conjugated organometallic complexes, holographic materials, and sensor materials.</p>	<p>Prof. of Chemistry, Dir. of Curr. Prog., FNSSI, SUPA Faculty Chem/Forensic Sci./URP, Department of Chemistry, Syracuse University Syracuse, New York 13244-4100 (315) 443-4880 (Office) (315) 443-4070 (FAX) (315) 480-5276 (cell) sponsler@syr.edu</p> <p>Web: https://thecollege.syr.edu/people/faculty/sponsler-michael-b/</p>

<p>Dr. Melanie Nappa-Carroll, Ph.D., Syracuse University</p> 	<p>Asst. Director, SUPA. Melanie Nappa-Carroll, Ph.D., Syracuse University. Forensic Science, Chemistry and Undergraduate Research SUPA Program Administrator. Dr. Carroll brings years of experience as a Syracuse City School District Social Studies and Special Ed teacher and administrator. She is a SU undergraduate alum in education, before going on to Boston College for her master's and receiving her doctorate in Educational Leadership from the SU School of Education.</p>	<p>400 Ostrom Avenue Syracuse, NY 13244 Assistant Director SUPA Program Administrator Forensic Science Program Admin., Project Advance Syracuse University Syracuse, New York 13244 (315) 443-5709 (315) 863-3899 (cell) msnappa@syr.edu</p>
<p>Prof. Don Siegel, Syracuse University</p> 	<p>Emeritus of Earth Sciences, Development of lump-parameter and other modeling approaches to characterize non-point contamination and solute transport where data availability is minimal in real world applications; Spring and seepage face hydrology; Isotopic and other geochemical analysis of water and solutes to characterize contaminant sources including PFAS compounds, MBTE and or organic compounds.</p>	<p>SUPA Faculty, Syracuse University Syracuse, New York 13244-4100 (315) 443-3436 (Office) disiegel@syr.edu</p>

Guest Speakers:

<p>Patrick Williams</p>	<p>Humanities Librarian, Digital and Open Scholarship Lead SU Library</p>	<p>jpwill03@syr.edu</p>
<p>Dr. Matt Schuchman</p>	<p>North Clarkstown High School</p>	<p>mschuchman@ccsd.edu</p>
<p>Hannah O'Leary</p>	<p>Rachel Carson High School</p>	<p>holeary@rachelcarsonhs.org</p>
<p>Elizabeth Stephens</p>	<p>Mahopac High School</p>	<p>stephense@mahopac.org</p>

SYRACUSE UNIVERSITY PROJECT ADVANCE UNDERGRADUATE RESEARCH

HANDOUT MATERIALS

SCHEDULE OF SESSIONS

SUPA ADMINISTRATIVE INFORMATION

“WHY SUPA CHEMISTRY”

SYLLABUS

Project Advance Chemistry Course Offerings: Forensic Science (CHE 113) and General Chemistry (CHE 106/107 and 116/117)

Why SUPA? - Syracuse University's Project Advance (SUPA) is a cooperative effort between Syracuse University and high schools throughout the Northeast that provides qualified high school students with the opportunity to enroll in challenging Syracuse University courses that are offered in their own schools. We strongly believe that our chemistry departmental courses through Project Advance (General Chemistry and Forensic Science) provide an enormous advantage to college-bound students. In an effort to let you know about this program, some of the primary reasons why we feel that our offerings through Project Advance are so valuable to both teachers and students are briefly summarized below;

Student Credit Acceptance and Transfer Rate – Students who successfully complete SUPA courses receive a regular Syracuse University transcript recording their credit that is identical to that of a main campus student. Importantly, students enrolled at over 500 institutions nationally have reported that Project Advance has a greater than 92% actual success rate in transferring credit to other colleges and universities. This is in marked contrast with other programs, such as AP, where the reported success rate is approximately 49%. In the relatively unusual cases where students have trouble transferring SUPA credit, the Project Advance office can often effectively help students in obtaining credit.

Full Credit Transfer – The Project Advance General Chemistry course provides a full 8 credits and the Forensic Science course provides a full 4 credits. Students with these SUPA credits typically receive the complete compliment of credits when they transfer. This is in contrast to AP and similar programs in which a student typically must receive a 4 or 5 in order to transfer *at most* half of the credits (usually the maximum allowed is 3-4 credits for chemistry). Transferring fewer than the full compliment of credits often does not significantly enhance the students college program. This is especially true in chemistry, where students usually find that they need to retake the first semester in order to compete effectively in second semester coursework (for which they did not receive transfer credit). Additionally, success in the SUPA course is determined over an entire year of testing and evaluation, rather than based solely upon a single examination.

Teacher Seminars – Each semester, Project Advance runs a unique course-specific seminar for teachers in the program at both upstate and downstate sites. These seminars typically involve presentations by forefront researchers in the field. Recent presentations in Chemistry have focused on topics including “Teaching with Microscale Lab

Techniques” [Mark Langella], “The Chemistry and Biology of Protein Post-translational Modification” [Prof. James Hougland], “Hands-on experience with new modular chemistry lab instrumentation.” [Sally Mitchell], and “Bottom-Up Nanotechnology: recent research advances, and how to integrate them and other materials chemistry topics into the general chemistry lecture” [Prof. Mathew Maye], among many others. Forensics topics have included “Firearms Investigations: Hands-on experience in developing curricular materials in firearms investigations” [Matt Kurimsky] and “Justice from the Public Defender Perspective” [Stephen Mercer, State of Maryland Public Defender Office]. Importantly, these seminars also provide a unique forum within disciplines for teaching professionals from both high school and university settings to discuss common concerns and ideas.

Training and Support – New teachers of the SUPA chemistry and forensics courses are provided with detailed training in the summer to facilitate their offering of the course. Complete instructional materials and course information, along with in-depth discussions, are provided at these training sessions. [Teachers may also take this training, at reduced rate, for Syracuse University graduate credit.]

Inexpensive Credit - Project Advance courses are probably the least expensive credits a student will ever receive. Currently, Project Advance students pay ca. \$112 per credit (in comparison with over \$1,500 per credit on campus and with community colleges well over \$150 per credit). In addition, limited emergency tuition assistance is available for eligible students who are unable to manage even these costs.

Administrative Support – Project Advance has a large, full time support staff of professional administrators and faculty to administer and oversee the program. Currently, about 6,600 students are enrolled in SUPA classes annually involving approximately 500 teachers in 140 high schools.

Classroom Visitations – Each semester that a course is offered, faculty visit each and every high school classroom and interact directly with the students to answer their questions and to provide insights into forefront research in the field. Additionally, SUPA program administrators meet with the teachers and high school administrators to address any questions or concerns during these visits.

University Curriculum and Exams – Each semester, materials are provided to ensure the close tie between the high school offering and the main campus course. For example, in Chemistry, Syracuse University faculty prepare a complete set of exam questions comparable to those used in our main campus classes. These questions are sent to the teachers at the beginning of each semester. The curriculum for the courses are completely comparable to similar courses offered at universities nationwide.

Project Advance “History” – Project Advance recently celebrated its 40th anniversary, making it one of the oldest national co-enrollment programs. Importantly, it is also one of the most honored programs and has received awards from the National Commission of Excellence in Education, the National Institute of Education, the Carnegie Foundation for the Advancement of Teaching, and the American Association of Higher Education. Project Advance has also served as a model for similar programs at such institutions as Indiana University, the University of North Carolina, Pittsburgh University and the University of Wisconsin, among many others.

As mentioned above, Project Advance provides many important services to the high schools including in-service training for high school instructors, a continuing forum for communication between educators from both school and university settings, and extensive ongoing research and evaluation in an effort to systematically improve instruction. As an aside, Project Advance is a not-for-profit auxiliary unit of Syracuse University and is neither used as a profit making center nor a recruiting tool for Syracuse University. Project Advance primarily serves New York, New England and the Mid-Atlantic States.

Both teachers and students that have participated in SUPA have very high regard for the program. For example, in a recent study, 95% of Project Advance graduates highly recommended SU courses offered through the SUPA program and 96% of principals felt SUPA helped students develop more realistic expectations of college work. Furthermore, 92% of teachers reported they have significantly benefited from exposure to new ideas and developments in their discipline because of their SUPA involvement.

For additional information, please contact either Prof. Jim Spencer, Chemistry Department, at (315) 443-3436 [jtsponce@syr.edu] or Melanie Carroll Nappa, SUPA Program Administrator, at (315) 443-2404 [msnappa@syr.edu] or visit the website at www.supa.syr.edu.



**Introduction to Science
Research
URP 150/250
Syracuse University**



Revised 2/24/2017

INTRODUCTION

The primary goals of the Science Research Program is to provide critical opportunities for students to understand what constitutes modern scientific research and to gain first-hand mentored experience with research in scientific disciplines. These goals are achieved through both a close examination of the scientific discovery and communication process as well as through direct "hands-on" involvement in carefully guided basic and applied research projects.

The participation of scientists at an early stage in their development in scientific research is a logical and, in fact, absolutely necessary feature of preparing the next generation of scientists. The active involvement of students in the creation of new knowledge and understanding is vital component of the educational experience of science students. The hallmark of these activities is the development of close student-teacher-researcher interactions that extend beyond the boundaries typically set by in-class instruction.

Research is difficult to define precisely and must be very broadly constructed and interpreted to include the fullest range of activities as delineated by individual disciplines. Consistent with the University's mission, all forms of relevant scholarship, creative activity and professional involvement are encompassed by the term "research". Students engaged in their own scholarship bring an enthusiasm that cannot be overestimated and must be heartily encouraged and nurtured. This program seeks to foster student involvement in the creative, developmental, and technical aspects of exploration fundamental to a scientific and technical discipline.

LEARNING GOALS

The fundamental goal of the program is to encourage students to encounter scientific disciplines in a first-hand fashion through both a deeper exploration of the fundamental process of science discovery itself and through carefully guided research projects in which they are full participants. Specific goals of the program include:

- Identify and foster talented, interested and motivated students focused on science research leading to science-based careers;
- Provide students an accurate and detailed understanding of what constitutes high-quality research and how to distinguish this from pseudoscientific work;

- Provide students with the basic tools required to conduct research such as:
 - An ability to read, understand and discuss work reported in the primary scientific literature;
 - An understanding of how to frame an important scientific question into a testable hypothesis;
 - An ability to design and evaluate an experimental research plan to test a hypothesis;
 - An ability to work effectively as part of a team in problem-solving;
 - A basic understanding of statistical methods for research;
- Provide opportunities for students to design, develop, execute, complete, and communicate high-quality research projects;
- Promote independent and critical thinking;
- Provide College credit for science research work.

COURSE DESCRIPTION

This program is a collaboration between Syracuse University's iLEARN Program, Project Advance and high schools science departments. The program involves a multi-year approach, with each year focused upon the exploration of different aspects of scientific inquiry and discovery. University credit (URP 150/250) is provided for students enrolled in their junior and senior years (4 credits per year). Often, however, students will begin in their sophomore years. Each year of the program is focused upon different broad themes in exploring scientific research. These themes progress from an in-depth examination of the scientific method itself through the completion of a significant research experience for the student. These themes may be considered as exploring the “basic tools of scientific research and discovery”, the “process of scientific research” and the “results of scientific research”.

- The typical program would consist of several years of involvement (optionally starting in the sophomore high school year) such as:
 - 10th grade:
 - **“Basic Tools of Scientific Research and Discovery”**. *Basic Concepts*: what is scientific research, what is the scientific method, understanding basic research tools, discerning real science v. pseudoscience, how to pose a valid scientific question, how to read critically a scientific paper, how a research paper is constructed, development of student communication and presentation skills (talks, posters, etc.), how to collect data and keep an appropriate notebook/journal, understanding the stylistic considerations of scientific communication (e.g., citations, paper sections and format, etc.), fundamentals of basic statistical analysis, and others.
 - 11th Grade:
 - **“Process of Scientific Research”**. *Basic Concepts*: How to define, develop and refine a detailed scientific research project, how to complete background literature searching, how to prepare a research proposal with a plan of investigation, how to identify/locate a mentor or research instructor (extramural or intramural), how a research project is begun and continues in

experimental work. Some students may profitably identify their mentors early in this process.

- **As a result, students are expected to:**
 - Identify a research project and prepare a detailed plan for execution;
 - Gain experience presenting, both orally and in writing;
 - Gain experience presenting critical reviews of papers in the scientific literature relevant to the research;
 - Conduct hands-on research experimentation.
- 12th grade:
 - **“Results of Scientific Research”**. *Basic Concepts:* continuing a project towards completion of the research experimentation and evolution of project, how to compile, analyze and interpret data from experiments, how to write up research in standard scientific format (depends on field but consistent with papers published in the field), and how to present research at symposium or similar meeting.
 - **As a result, students are expected to:**
 - Complete a significant research project including the collection, analysis and interpretation of primary experimental data;
 - Present project in a public forum;
 - Prepare a manuscript in a fashion suitable for publication in a journal appropriate to their field of inquiry.

SYRACUSE UNIVERSITY COLLABORATION

As part of this Program, student will receive Syracuse University Undergraduate Research Program (URP 150/250) credit. Upon completion of the 11th grade curricular deliverables, students would receive four credits of URP 150: “Science Research I” [4 credits]. Similarly, 12th grade students would receive four credits of URP 250: “Science Research II” [4 credits] upon completion of the Program’s curricular deliverables. The credit and all associated logistics for the students will be handled through SUPA’s typical process and receive a regular Syracuse University transcript recording their credit.

This program is a collaboration between Syracuse University and the high school. SU faculty will visit with involved students in their schools and assist as possible in the program consistent with SUPA guideline.

At the end of the program, students will provide to Syracuse University the final manuscript detailing their research project including the collection, analysis and interpretation of primary experimental data in a format consistent with that used in the relevant field.

ACADEMIC INTEGRITY: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the

integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>.

DISABILITY STATEMENT REGARDING DISABILITY-RELATED ACCOMMODATIONS

Students who are in need of disability-related academic accommodations must contact their instructor as soon as possible. Accommodations, such as exam administration, are not provided retroactively; therefore, planning for accommodations as early as possible is necessary.

Religious Policies: SU's religious observances policy, found at http://supolicies.syr.edu/emp_ben/religious_observance.htm, recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance **provided they notify their instructors early.**

Accommodations only include the holiday itself and **do not** cover travel days. Accommodations and related support services such as exam administration are not provided retroactively and must be requested in advance.

MISCELLANEOUS:

- (2) No student will be refused admission because he or she is unable to participate in a course requirement because of his or her religious holy day requirements. According to University policy, "an opportunity to make up examinations and other class work [due to religious observances] will be provided...if the instructor is notified in writing one week before the absence."
- (3) Excuses from class for medical reasons will only be given if such absences are advised by a health care provider or the Health Center based upon clinical findings and prescribed treatment recommendations. Verification must be made in writing.
- (4) Attendance in classes is expected.
- (5) This class will be using Turnitin, a plagiarism prevention system. The ease of using the internet has made it very easy for students to "cut and paste" material into papers that they are writing without proper citation. I will submit all/some/ papers that you write in this class to Turnitin, a service that identifies "matched text." I will then interpret the originality report,

based on your writing capability and writing style. In this class, you will also be given the opportunity to submit your own papers to Turnitin to check that all sources you have used are properly acknowledged and cited. Note that all submitted papers will be included as source documents in the Turnitin.com reference database, solely for the purpose of detecting plagiarism of such papers.