Training in the Responsible Conduct of Research (RCR). V. 8.2023

*All or part of this content can be used or modified to suit your grant purpose.*

*Course Availability.* \_\_\_\_\_\_\_\_\_\_ scholars will meet the RCR training requirement by successful completion of a graduate level responsible conduct of research course offered by the VCU Office of Research and Innovation. There are 4 equivalent RCR courses taught by the Office of Research and Innovation each year: two in the fall semester (OVPR601 and 603), and one each in spring and summer sessions (OVPR602). In addition, students may enroll in one of several programmatically-based courses (i.e. Biology, Nursing, Chemistry) that offer RCR content similar to the Office of Research and Innovation course. These offerings make RCR instruction available year-round for our \_\_\_\_\_\_ scholars. Faculty involved in program-based RCR courses are developing a VCU-wide RCR training initiative for faculty and staff that will eventually complement current course instruction for graduate students and trainees.

*Course Format:* The Office of Research and Innovation courses are taught with a combination of in-class sessions and online reading. Classroom sessions are comprised of interactive presentations which are linked to small group discussions of case studies (these activities amount to 8 to 10 in-person contact hours). Presentations of relevant content and interactive exercises occur in plenary sessions. Learning-centered approaches used to engage students include: 1) completion of survey instruments prior to or during class to probe attitudes and knowledge about relevant topics; 2) discussion of general questions and cases found at the end of each chapter in the text as well as other sources; and 3) discussion of relevant current events covered in the media.

Grading in the course is based on attendance, class participation or completion of assignments. Attendance at in-class sessions is mandatory; an excused absence is permitted but must be offset with an acceptable makeup assignment prescribed by the course director.

*Subject Matter:* The course uses *Scientific Integrity: Text and Cases in Responsible Conduct of Research- 4th Edition* by F. L. Macrina(ASM Press, Washington, DC.) as its required textbook. The fourth edition of this text was published in July 2014. This edition has been adopted for use at 51 US institutions and 14 international institutions making it one of the most widely used teaching resources in the field (Source: ASM Press). VCU Libraries has procured an e-book version of the fourth edition which has unlimited, multi-user access.

The course content covers the nine commonly accepted NIH instructional topics taught in RCR courses. These are reflected in the required reading in the 4th edition of the *Scientific Integrity* text as illustrated in the following table.

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| **NIH Content Area** | **Corresponding Content in *Scientific Integrity (4th edition)*** |
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| conflict of interest – personal, professional, and financial | Chapter 7 Managing Competing Interests |
| policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices | Chapter 5 Use of Humans in Biomedical ExperimentationChapter 6 Use of Animals in Biomedical ExperimentationAppendix IV Sample Protocols for Human and Animal ExperimentationAppendix VII Safe Laboratory Practices Resources |
| mentor/mentee responsibilities and relationships | Chapter 3 Mentoring |
| collaborative research including collaborations with industry | Chapter 8 Collaborative Research |
| peer review | Chapter 4 Authorship and Peer Review |
| data acquisition and laboratory tools; management, sharing and ownership | Chapter 9 Research Data and Intellectual PropertyChapter 10 Scientific Record KeepingAppendix V Example of of U.S. Patent SpecificationAppendix VI Laboratory Notebook Instructions |
| research misconduct and policies for handling misconduct | Chapter 1 Methods, Manners, and the Responsible Conduct of ResearchChapter 2 Ethics and the ScientistAppendix III Standards of Conduct |
| responsible authorship and publication | Chapter 4 Authorship and Peer Review |
| the scientist as a responsible member of society, contemporary ethical issues in biomedical research, and the environmental and societal impacts of scientific research | Chapter 11 Science, Technology and Society |

In addition to the above chapters, readings from other resources include the 2017 report on Fostering Scientific Integrity by the National Academy of Sciences, Engineering, and Medicine, interactive videos from the DHHS Office of Research Integrity as well as topically relevant published papers and media articles. Each of the VCU RCR courses are catalogue-listed and carry 1 hour of academic credit, involving at least 8 in-class contact hours. All are approved by the VCU Graduate School and comply with the operational requirements of the Office of the Provost as official university courses. Students come from a variety of disciplinary concentrations and academic levels. Plenary presentations as well as cases for discussion or written response address biomedical, social and behavioral and other basic science disciplines.

*Faculty Participation*: Course instructors and guest presenters are expert faculty and staff. Depending on the particular course, faculty and advanced students and trainees participate as facilitators in case discussions.

*Duration and Frequency of Instruction:*  RCR training at VCU is mandated by policy to occur at least once during each career stage, preferably within the first year, but no less than once every four years for undergraduate and graduate students, postdoctoral fellows and early career faculty listed on federal grants, In the event that refresher training is needed to meet the four year cycle requirement, scholars will be required to re-take one of the RCR courses. The dynamic content of RCR topics, the variety of expert speakers, and the use of different case studies, provides appropriate refreshing of knowledge and principles in RCR. Content is adjusted to stay current with changing trends or nascent topic areas, so a course attended 4 years earlier would reflect significant updating to achieve currency. For example, we have implemented changes in our course to reflect publication developments such as predatory publishing and preprint servers, changes in the common rule, and content material that addresses reproducibility and rigor, laboratory safety, appropriate lab personnel dynamics, and impacts of AI approaches on scientific rigor.

Supplemental Educational Activities. The Office of the Vice President for Research and Innovation (OVPRI) and VCU Libraries coordinated a lecture series that provides a platform for offering related content material in selected RCR topics. Using the resources from the VCU Sanger Fund for Ethics, we have sponsored 1-2 speakers/year who present a university-wide lecture on a topics related to the responsible conduct of research. In the past, speakers have included John Wilbanks from Sage Bionetworks (Politics of Personal Research Data), John Willinsky from Stanford University (The Intellectual Properties of Learning), Lawrence Tabak, principal deputy director of the National Institutes of Health (Data Reproducibility), Bruce Alberts, Univ. California, San Francisco (Science and the World’s Future in 2014, and in 2017 a Lasker Lecture, Keeping Science and Society Healthy: Challenges for Scientists), Madelyn Wessel, J.D., VCU Counsel/Office of the Va. Attorney General (Intellectual Property and the Academy), Brian Nosek ,Professor of Psychology at the University of Virginia and co-Director of the Center for Open Science (Improving Transparency and Reproducibility of Scientific Research), Lynn Zentner, J.D., Director of Institutional Compliance, University of Minnesota (Institutional Conflict of Interest), Jacob Rooksby, Associate Professor of Law, Duquesne University (The Branding of the American Mind: How Universities Capture, Manage and Monetize Intellectual Property), and Jonathan Moreno, Silfen University Professor at the University of Pennsylvania (Mind Wars: Brain Science and the Military in the 21st Century), Ross McKinney, MD, formerly at Duke University, now at the AAMC (Conflict of Interest in Human Subject Research). The Sanger Lectures in 2018 commemorated the centennial of the 1918 influenza epidemic. In February 2019, Jeffrey Taubenberger (NIAID Investigator, and an MD-PhD VCU graduate) spoke on viral pathogenesis including dual use research of concern. In October 2018, Gina Kolata (New York Times Science writer and author of the book “Flu”) gave the second Sanger Series lecture on this topic. \_\_\_\_\_\_ scholars are highly encouraged to attend Sanger Series Lectures during their tenure in the program. In addition to Sanger Lectures, the VCU Libraries and the Center for Clinical and Translational Research offer presentations that relate to topics in scientific integrity throughout the year. Although the Sanger Series is currently on hiatus, the VCU Libraries continue to offer programs relevant to RCR education. In addition, members of the office of research integrity and ethics offer frequent RCR-related presentations across the university to faculty and/or student groups as part of orientation programming, lunch time seminars, course lectures, and faculty departmental meetings.

The Office of the Vice President for Research and Innovation has created and hosts an institutional Data Science initiative.  The overarching goal of this initiative is to ensure the integrity, transparency, and reproducibility of the research record at VCU.  VCU has executed an MOU with the Center for Open Science and is registered as an Open Science Framework (OSF) institution. The OSF is a mature platform offering options for publicly accessible data storage and sharing, and connectivity of workflows.   As an OSF institution, VCU is afforded a layer of service that allows a single sign-on, as well as a branded landing page that enables connecting to local data repositories.  This service to VCU faculty, trainees, and students and comes with its own analytics page that can provide useful insight on the impact of research beyond citation number.  In 2018 the OSF announced that its enrollment reached 100,000 users. At present, VCU has the largest number of users of any single institution.  The Data Science initiative is directed by faculty member, Dr. Tim York, who is supported in part by the OVPRI.  Dr. York, a member of the Human & Molecular Genetics Department, as well as select graduate students continue to develop a rigor, reproducibility, and open science training platform in cooperation with relevant institutional programs and departments. He and colleague, Dr. Dana Lapato teach data science courses which are open to graduate students across the university.  Both Dr. York and Dr. Lapato present in VCU RCR courses and give regular presentations about OSF for university-wide audiences.