

FULL PROPOSAL

Navigating Science in the Light of Faith *The Biological Sciences*

Submitted by

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Science and Faith in Seminary Formation
For College and Pre-Theology Programs
John Carroll University

*"Faith broadens the horizons of reason to shed greater light on the world
which discloses itself to scientific investigation." —Pope Francis*

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Navigating Science in the Light of Faith

The Biological Sciences

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Course Description

This course, intended primarily for online delivery, teaches the non-scientist seminarian how to articulate developments in current research in biological or biochemical fields—with particular emphasis on evolutionary biology, genetics, or neuroscience—by reading scientific papers. Then the course teaches the seminarian how to classify the conclusions in the scientific papers as neutral, contradictory, or consistent with the tenets of Catholic faith. Using online meetings, course management software, and written communication, the seminarian will be guided through the evaluation of a single scientific paper from a refereed journal and then a broader field of research. The two evaluations will be edited and published on a website designed to share the fruits of the course, *Navigating Science in the Light of Faith*. The purpose for publication is to give the seminarian tangible pastoral experience leading the laity through modern challenges in science. Publication provides a real-life, built-in assessment process—a course presentation beyond the course.

The next best thing to doing lab work is reading what scientists report in their scientific papers in refereed journals, so this course begins with instruction and guidance on reading scientific papers. The first 5-week segment, “Unit One: The Nuts and Bolts of Scientific Papers,” teaches 1) how scientific work is generally done per the scientific method in laboratories, 2) how scientific papers are organized once a set of experiments yields data that can be analyzed into proposed conclusions to share with the scientific community, 3) how to read and summarize a published scientific paper in a refereed journal, and 4) how to dig into the scientific record to gain historical context about the development of a specific area of research. During the first segment, weekly

quizzes will be given and reviewed to reinforce the material and develop literature research skills.

Once the science is summarized, it can be assessed in the light of faith. The second 5-week segment, “Unit Two: Sorting Science in the Light of Faith,” teaches 1) how to assess whether provisional scientific conclusions directly contradict dogmatic tenets of the Catholic faith, 2) how to identify questions where legitimate opinions may be explored and defended, 3) and how to see when scientific conclusions, provisional though they are, are consistent with what has been divinely revealed about the Creation of the physical realm. Particular emphasis in this segment is on the way to communicate “science in the light of faith” without subjecting faith to science.

Weekly quizzes will also be given during the beginning of the second segment. At the end of the second segment, a paper will be due that interprets the scientific content in the light of faith for the pastoral purpose of guiding the laity. This paper will undergo an editing process for publication on a website dedicated to the *Navigating Science in the Light of Faith* courses. The paper will first be edited by peer review among two students in the class, thereby giving students further exposure to exploring scientific topics, and then the paper will be edited by an expert competent to review science and faith writing, thereby mimicking the scientific refereed journal publication process. The final paper will be graded, but the editing process is meant to ensure success and excellence.

The third 5-week segment, “Unit Three: Pastoral Publishing of the Faith and Science Dialogue,” will be a guided study of a particular topic (i.e. a collection of scientific papers) chosen by the student within boundaries in the biological or biochemical fields with particular emphasis on evolutionary biology, genetics, or neuroscience.

The final research project will also be prepared for publication. The paper will present the scientific context and current conclusions of the active area of research and provide a detailed analysis of how the research should be understood in the light of faith. The paper will be peer-reviewed by

classmates and then edited before publication. Thus the seminarian will go from a) comprehending scientific developments to b) appraising them in the light of faith to c) communicating his synthesis to the faithful.

It could be argued that a seminarian does not have the time or ability to read research papers produced at the doctoral and postdoctoral academic levels, but that argument can be refuted. To navigate the science in the greater light of faith, one must be able to first *follow* the science as it develops in current times, which is more important than acquiring a textbook knowledge of entire fields. Reading a scientific paper does not require a doctorate in science because the papers are written in an orderly and concise way. Reading scientific papers requires a discipline to comprehend words with precise technical meanings. Seminarians are particularly well-suited for this skill because they already have the skill for reading the organized theological documents of the Church and the structured, logically rigorous questions and answers of St. Thomas Aquinas. Teaching seminarians to read scientific papers is a matter of teaching them how to transfer their skills to a new type of document.

Pope Francis wrote in *Lumen Fidei* that “faith broadens the horizons of reason to shed greater light on the world which discloses itself to scientific investigation.” This quote represents the spirit of the course. The education and work of a scientist today is exceedingly specialized. Scientists are not taught philosophy or theology, and often do not know much about the history of their own fields or the details of research beyond their specialties. Therefore a seminarian or priest (or philosopher or theologian) can “broaden the horizons of reason” and “shed greater light” on scientific investigation. Such a visionary not only pastorally guides the faithful in navigating science; he ultimately aids the scientific community by interpreting science in a broader context and helping to guide its progress.

Weekly Course Schedule

The course will meet twice weekly via Adobe Connect classroom for live instruction and feedback from the professors. The assignments will be communicated, critiqued, and tracked in Populi learning management system. The final version of two papers will be published online on the *Navigating Science in the Light of Faith* website.

Unit One: The Nuts and Bolts of Scientific Papers

Week 1

Course Overview:

- Explain how to get started in Populi and Adobe Connect.
- Explain where to find course materials.
- Introduce purpose and structure of the course, to learn to assess scientific papers in the light of faith.
- Present a tour of the website for publishing course papers, *Navigating Science in the Light of Faith*.
- Review learning objectives.
- Review assessment criteria and metrics.
- Review the editing and publication process.
- Explain technology requirements.
- Explain etiquette for peer-reviewing essays.
- Introduce instructor.

Assignment:

- Upload a head shot and write a brief 200-word maximum third-person biography suitable to accompany a publication.

Week 2

Discussion:

- Check for any problems with materials or technologies.

- Discuss how scientific work is generally done per the scientific method in laboratories.

Assignment:

- Read: “How Scientific Work is Done.”
- Take quiz: How Science is Done. This quiz will contain questions requiring short answers.

Week 3

Discussion:

- Review quiz results.
- Discuss how scientific papers are organized once a set of experiments yields data that can be analyzed into proposed conclusions to share with the scientific community.

Assignment:

- Read: “How Scientific Papers are Organized.”
- Take quiz: Organization of Scientific Papers. This quiz will be a straightforward multiple choice quiz on the anatomy of a paper.

Week 4

Discussion:

- Review quiz results.
- Discuss how to read and summarize a published scientific paper in a refereed journal using examples provided by professor.

Assignment:

- Read: “How to Summarize a Scientific Paper.”
- Take quiz: Summarizing a Scientific Paper. This quiz will guide the student through a paper and require him to summarize it.

Week 5

Discussion:

- Review quiz results.
- Discuss how to dig into the scientific record to gain historical context about the development of a specific area of research.

Assignment:

- Read: “Digging Into Scientific Literature.”
- Take quiz: Digging Into Scientific Literature. This quiz will require the student to look up references two and three layers deep.

Unit Two: Sorting Science in the Light of Faith

Week 6

Discussion:

- Review quiz results.
- Discuss how to assess whether provisional scientific conclusions directly contradict dogmatic tenets of the Catholic faith.
- Discuss how data is analyzed, how to detect when the author crosses the boundary of science, and how to identify whether a conclusion drawn by an author is more or less challenging to the understanding of dogma.

Assignment:

- Read: “When Science Contradicts Dogma.”
- Take quiz: When Science Contradicts Dogma. This quiz will guide the student through the analysis of one scientific paper.

Week 7

Discussion:

- Review quiz results.
- Discuss how to identify questions where legitimate opinions may be explored and defended.

Assignment:

- Read: "Identifying Legitimate Opinions."
- Take quiz: Identifying Legitimate Opinions. This quiz will guide the student through the analysis of one scientific paper.

Week 8

Discussion:

- Review quiz results.
- Discuss how to see when scientific conclusions, provisional though they are, are consistent with what has been divinely revealed about the Creation of the physical realm.

Assignment:

- Read: "When Science is Consistent with Dogma."
- Take quiz: When Science is Consistent with Dogma. This quiz will guide the student through the analysis of one scientific paper.

Week 9

Discussion:

- Review quiz results.
- Discuss the first paper that will assess the scientific content and analyzes it in the light of faith for the purpose of pastorally communicating guidance to the laity.
- Discuss the editing process for publication on a website dedicated to the *Navigating Science in the Light of Faith* course.

Assignment:

- Read: "How to Articulate an Opinion of a Paper."
- Get approval from professor for one scientific paper to analyze.
- Rough draft due for first paper.

Week 10

Editing:

- Assign peer review groups among students in the class.
- Review peer papers assigned for editing.
- First round of edits due mid-week.
- Submit paper for a professional editor competent to review science and faith writing.

Unit Three: Pastoral Publishing of the Faith and Science Dialogue

Week 11

Editing:

- Finalize edits from professional editor.
- Submit paper for publication.

Assignment:

- Read: "Assessing Your Online Audience."
- Submit research topic for approval.
- Submit sources for second paper, at least five scientific papers in a specific field of research in the biological or biochemical fields with particular emphasis on evolutionary biology, genetics, or neuroscience where the laity needs guidance.

Week 12

Research and Writing:

- Submit summary of sources for professor review.
- Submit outline of paper.

Week 13

Writing Draft:

- Review suggestions from professor.
- Using summaries, outline, and professor suggestions, compile rough draft.

- Submit to two peer reviewers assigned by professor.
- Peer review two papers assigned for editing.

Week 14

Publishing Final Draft:

- Review edits from peer reviews.
- Submit final draft for publication on the website dedicated to the *Navigating Science in the Light of Faith* course.

Week 15

Review and Assessment:

- Follow social media statistics on the paper at the website dedicated to the *Navigating Science in the Light of Faith* course.
- Complete course evaluation.
- Final quiz to review main points from Units One and Two.

Description of the Assignments

Unit One: The Nuts and Bolts of Scientific Papers

Week 1

- Upload a head shot and write a brief 200–word maximum third–person biography suitable to accompany a publication.

Week 2

- Read: “How Scientific Work is Done.” This is a chapter in a book published for teaching this course.
- Take quiz: How Science is Done. This quiz will contain questions requiring short answers to assess understanding of the accompanying chapter.

Week 3

- Read: “How Scientific Papers are Organized.” This is a chapter in a book published for teaching this course.
- Take quiz: Organization of Scientific Papers. This quiz will be a straightforward multiple choice quiz on the anatomy of a paper to reinforce knowledge of the components and information in such a paper.

Week 4

- Read: “How to Summarize a Scientific Paper.” This is a chapter in a book published for teaching this course.
- Take quiz: Summarizing a Scientific Paper. This quiz will guide the student through a single scientific paper and require him to summarize it.

Week 5

- Read: “How to Dig Into Scientific Literature.” This is a chapter in a book published for teaching this course.
- Take quiz: Digging Into Scientific Literature. This quiz will require the student to look up references two and three layers deep for practice digging into scientific literature and assessment of correct answers so the student knows he is doing the digging correctly.

Unit Two: Sorting Science in the Light of Faith

Week 6

- Read: “When Science Contradicts Dogma.” This is a chapter in a book published for teaching this course.
- Take quiz: When Science Contradicts Dogma. This quiz will guide the student through the analysis of one scientific paper. This paper will have easily identifiable statements that contradict dogma and will give the student practice articulating an objective response. When statements (such as that the soul does not exist or that the human is only material) are made, they go beyond legitimate bounds of physical science. There are key words to look for and concise ways to pinpoint the erroneous conclusions.

Week 7

- Read: “Identifying Legitimate Opinions.” This is a chapter in a book published for teaching this course.
- Take quiz: Identifying Legitimate Opinions. This quiz will guide the student through the analysis of one scientific paper. This paper will have easily identifiable statements that do not contradict Catholic teaching but that lead to conclusions beyond science that may pose challenges. It is important to be able to articulate such conclusions, identify the various opinions that may be held, and to guide others in appropriate ways to discuss these questions. The critical point of this

type of paper is to realize that science is never complete, so often times the appropriate reaction is simply to acknowledge the potential conclusions and refrain from settling on any opinion.

Week 8

- Read: “When Science is Consistent with Dogma.” This is a chapter in a book published for teaching this course.
- Take quiz: When Science is Consistent with Dogma. This quiz will guide the student through the analysis of one scientific paper. This paper will have easily identifiable statements that are consistent with Catholic dogma, such as that the universe seems fine-tuned for human life or that life seems intelligently designed. In this case, it is important not to give the impression that science provides evidence for (or proves) what we hold in faith revealed by God. Such thinking teaches that faith is subject to science. The correct view is that science keeps asking questions and from a position of faith, we can follow those questions without depending on science to provide all the answers. Faith illuminates the science.

Week 9

- Read: “How to Articulate an Opinion of a Paper.” This is a chapter in a book published for teaching this course.
- Get approval from professor for one scientific paper to analyze. With knowledge of how to categorize scientific opinions in the light of faith, the student then must find his own paper to analyze.
- Rough draft due for first paper. Instructions will be given for an outline to follow, i.e. how to introduce the paper, how to systematically present the questions relating to science and faith, how to identify opinions and navigate challenging questions.

Week 10

- Assign peer review groups among students in the class. Each student will be reviewed by two other students and will review two other students.
- Review peer papers assigned for editing.
- First round of edits due mid-week. Students will read each other's papers and comment on the clarity of the points. In these papers, clarity is more important than claiming an absolute position.
- Submit paper for a professional editor competent to review science and faith writing. This not only provides experience with the publication process, but also provides built-in assessment of the student's work. The goal is excellence.

Unit Three: Pastoral Publishing of the Faith and Science Dialogue

Week 11

- Read: "Assessing Your Online Audience." This is a chapter in a book published for teaching this course.
- Submit research topic for approval. The second paper will cover a collection of scientific papers in a specific field of research.
- Submit sources for second paper, at least five scientific papers in a specific field of research in the biological or biochemical fields with particular emphasis on evolutionary biology, genetics, or neuroscience where the laity needs guidance. The student will need assistance digging into the literature. The goal is to cover a topic more broadly with a historical background and guidance about possible future directions in that research.

Week 12

- Submit summary of sources for professor review.
- Submit outline of paper. This week is dedicated to preparation for writing the draft. These kind of papers must put technical language into communicable language for the laity, so considerable time is spent ensuring the technical language is adequately grasped.

Week 13

- Review suggestions from professor.
- Using summary, outline, and professor suggestions, compile rough draft.
- Submit to two peer reviewers assigned by professor.
- Peer review two papers assigned for editing.

Week 14

- Review edits from peer reviews.
- Submit final draft for publication on the website dedicated to the *Navigating Science in the Light of Faith* course.

Week 15

- Follow social media statistics on the paper at the website dedicated to the *Navigating Science in the Light of Faith* course. This is an addendum to the rest of the course. Online publishing give instant feedback in the social media, so it is a form of ongoing assessment available to the student.
- Complete course evaluation to provide professor with assessment of how well learning objectives were met.
- Final quiz to review main points from Units One and Two. This is to reinforce what was taught in the beginning of the course.

Course Objectives

Unit One: The Nuts and Bolts of Scientific Papers

- Explain how scientific work is generally done per the scientific method in laboratories.
- Describe how scientific papers are organized once a set of experiments yields data that can be analyzed into proposed conclusions to share with the scientific community.
- Demonstrate the ability to read and summarize a published scientific paper in a refereed journal.
- Demonstrate the ability to dig into the scientific record to gain historical context about the development of a specific area of research and summarize it in writing.

Unit Two: Sorting Science in the Light of Faith

- Demonstrate the ability to assess whether provisional scientific conclusions directly contradict dogmatic tenets of the Catholic faith by researching questions in compendiums of Catholic dogma.
- Identify questions where legitimate opinions may be explored, and defended and articulate them as guidance for the laity.
- Explain and instruct others how to see when scientific conclusions, provisional though they are, are consistent with what has been divinely revealed about the Creation of the physical realm.
- Analyze a scientific paper by summarizing the scientific background, methods, and conclusions and then commenting on any contradictions with Catholic dogma or doctrine, identifying questions where scholarly discourse may legitimately be conducted, and noting conclusions that are consistent with Divine Revelation.

Unit Three: Pastoral Publishing of the Faith and Science Dialogue

- Assess an active area of research within the biological or biochemical fields with particular emphasis on evolutionary biology, genetics, or neuroscience.
- Write a paper that presents the scientific context and current conclusions of an active area of research and provides a detailed analysis of how the research should be understood in the light of faith.
- Work with an editors to professionally edit and publish the paper online thereby pastorally aiding the laity and scientific community with a written work that teaches how to analyze current biological sciences in the light of faith.
- Begin to use social media to analyze the effectiveness of communication.
- Articulate a plan to continue to follow scientific developments.
- Overall, go from interacting with refereed journals to publishing an essay to communicate how to navigate science in the light of faith with the laity.

Measurement/Assessment

Unit One: The Nuts and Bolts of Scientific Papers

- Pass a quiz about how scientific work is generally done per the scientific method in laboratories.
- Pass a quiz about how scientific papers are organized once a set of experiments yields data that can be analyzed into proposed conclusions to share with the scientific community.
- Pass an essay quiz that guides the student through writing a scientific summary of a published scientific paper assigned by the professor. The grade for the quiz will be determined according to a rubric that quantifies how well the student summarizes the points accurately and communicates them effectively in common language with correct grammar, punctuation, spelling, and syntax.
- Pass an essay quiz that guides the student through writing a scientific summary of the background research to a published scientific paper by digging into the second and third layer of references. The grade for the quiz will be determined according to a rubric that quantifies how well the student chooses useful citations, explains them in the context of the current scientific paper, and comments on the background of a scientific field of research in terms a lay person can understand.

Unit Two: Sorting Science in the Light of Faith

- Pass a quiz covering a selected scientific paper by demonstrating the ability to assess whether provisional scientific conclusions directly contradict dogmatic tenets of the Catholic faith.
- Pass a quiz by identifying questions where legitimate opinions may be explored and defended.
- Pass a quiz to explain and instruct others how to see when scientific conclusions are consistent with what has been divinely revealed.
- Analyze a scientific paper in the light of faith by summarizing the scientific background, methods, and conclusions and then commenting

on any contradictions with Catholic dogma, identifying questions where scholarly discourse may legitimately be conducted and noting conclusions consistent with Divine Revelation.

- Publish the paper online after a peer-review and professional editing process.
- Begin to analyze social media for success in communication.

Unit Three: Pastoral Publishing of the Faith and Science Dialogue

- Work with the professor to select an active area of research within the biological or biochemical fields with particular emphasis on evolutionary biology, genetics, or neuroscience, assess it in the light of faith, and write a full report in language appropriate for instructing the laity. The paper will go from planning, to draft, to revisions suggested by peer-review and professional editing, to final form ready for publication online.
- Write the paper that presents the scientific context and current conclusions of an active area of research and provides a detailed analysis of how the research should be understood in the light of faith.
- Publish the paper online thereby aiding the laity with a written work that teaches how to analyze current biological sciences in the light of faith.
- Analyze social media for success in communication.
- Articulate a plan to follow scientific research in the light of faith with the opportunity to continue publishing essays that will guide the laity.

Pastoral Implications

After advising the Third International Conference of Catholics (in Brussels) in 1894, Pierre Duhem sent a letter to the Philosophy Department Head of the Institut Catholique. He wrote wise advice: “Then, I said frankly to all those good Catholic philosophers that, as long as they continued to talk about science without knowing a single word of it, the freethinkers would have fun at their expense, that in order to talk about questions relating to science and Catholic philosophy, one needs to have ten or fifteen years of pure science, and that, as long as they have not trained people with deep scientific knowledge, they must be kept silent.”

In our day, “ten or fifteen years” would amount to expecting seminarians to obtain a terminal science degree to be able to talk about questions relating to science and faith, and such an expectation is unreasonable. With the advent of globally published scientific literature in refereed journals, however, the next best thing to actually doing science is available to the public—i.e. reading scientific papers. If a seminarian learns how to navigate scientific literature, even at a high level, he can stay current in various areas of research as they interest him or his parishioners. Duhem’s warning is true today nonetheless. If people of faith talk about science without knowing science, they set themselves up to be discredited by “freethinkers who would have fun at their expense.”

But seminarians also need guidance knowing how to approach strange-sounding scientific conclusions. They need to face them confidently for the sake of prudent awareness of the reality of the most modern paths of research, but they also need to understand that faith is not subject to science. Faith comes first. We start by seeing the universe as Creation, and seeking to understand it. So when we read scientific papers, we need to be able to see the paper in the light of faith, accepting what is good and rejecting what contradicts Catholic dogma. This follows in the manner of St. Albert and St. Aquinas, and the other medieval scholars, assessing the Greek scientific corpus.

No paper, however, ever represents the final say on any field of research. It is a process to be navigated, analyzed, appreciated within its limits, but never to be taken as proof or disproof of our Catholic faith. We know that truth does not contradict truth.

To avoid entrapment by pop-science in popular media, one must be able to read the actual papers published in reputable refereed journals. In those papers, the provisional nature of science is most evident. Scientists are not trained in philosophy or theology either, so they can benefit from people capable of translating current science in the context of faith. By teaching the seminarian to read the scientific papers, assimilate the knowledge, and articulate guidance in the form of a published essay, the course moves beyond itself into the public and scientific domain of discourse. The course is not mere practice, but involves actually doing pastoral outreach.

Bibliography

- Course text, *Navigating Science in the Light of Faith*. To be developed.
- Either a one year subscription to *Science* journal (\$50) or *Nature* journal (\$119) online. These journals are the best way to follow current scientific developments.
- Bookmark these sites to follow online (no subscription cost). These sites have good articles reviewing the background of different fields of research as well as summaries of current research.
 - *Quanta Magazine* [[Link](#)]
 - *Live Science* [[Link](#)]
 - *World Science Festival* [[Link](#)]
 - *Smithsonian Magazine* [[Link](#)]
- Selected papers provided by the professor. As described in the “Description of the Assignments” section, these will be chosen to reinforce the skills taught.

Examples of papers and assessments:

Biochemical

- **Scientific Paper:** England, Jeremy L. “Statistical physics of self-replication.” *The Journal of Chemical Physics* 139, 121923 (2013). [[Link](#)]
- **Example of Assessment:** Trasancos, Stacy A. “The Appropriate Reaction to a Physical Theory of Life.” *Strange Notions* (2015). [[Link](#)]

Evolutionary Biology

- **Scientific Paper:** Villmoare, Brian, et. al. “Early Homo at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia.” *Science* Vol. 347 no. 6228 pp. 1352–1355 (March 20, 2015). [[Link](#)]

- **Scientific Paper:** DiMaggio, Erin N. “Late Pliocene fossiliferous sedimentary record and the environmental context of early Homo from Afar, Ethiopia.” *Science* Vol. 347 no. 6228 pp. 1355–1359 (March 20, 2015). [[Link](#)]
- **Scientific Summary:** Gibbons, Ann. “Fossil pushes back human origins 400,000 years.” *ScienceMag*, News, Archaeology (March 4, 2015). [[Link](#)]
- **Example of Assessment:** Trasancos, Stacy A. ““First Human” Discovered in Ethiopia: What It Means For Catholics.” *The Integrated Catholic Life* (March 11, 2015). [[Link](#)]

Metabolism

- **Scientific Paper:** Gaull, Gerald. “Development of Mammalian Sulfur Metabolism: Absence of Cystathionase in Human Fetal Tissues” *Pediatric Research* 6: 538–547 (1972). [[Link](#)]
- **Example of Assessment:** Trasancos, Stacy A. “Experiments on Intact Whole Live Fetuses and the Connection to Infant Formula.” *Catholic Stand* (August 5, 2015). [[Link](#)]

Genetics/Neuroscience

- **Scientific Paper:** Florio, Marta. “Human-specific gene ARHGAP11B promotes basal progenitor amplification and neocortex expansion.” *Science* Vol. 347 no. 6229 pp. 1465–1470 (March 27, 2015). [[Link](#)]
 - **Example of Assessment:** Trasancos, Stacy A. “The Trail of Fetal Body Parts in Scientific Papers.” *Catholic Stand* (July 24, 2015). [[Link](#)]
- Any of these will suffice, but two are better and all three are best.
 - Denzinger, Heinrich (1954). *The Sources of Catholic Dogma*. Loreto Publications.
 - Denzinger, Heinrich (2012). *Compendium of Creeds, Definitions, and Declarations on Matters of Faith and Morals*. 43rd Edition. Ignatius Press.
 - Ott, Ludwig (1974). *Fundamentals of Catholic Dogma*. TAN Books.
 - Required:

– *Catechism of the Catholic Church.*

Outreach

The outreach to the Catholic community is built into the course because the final paper is edited and published online on a website dedicated to the course titled, "Navigating Science in the Light of Faith." Seminarians will be invited to continue publishing in a similar manner after they complete the course. Priests will also be invited to take the course/s for continuing education.

From that site, as is one protocol in internet publishing, links to the papers will be shared on social media. The professor has an extensive network with Catholic online publishers because she has built and maintained websites with over 200 Catholic writers.

Holy Apostles College and Seminary will offer the same course to theology and philosophy students and as a MOOC to the general public, allowing successful students to publish their essays on the website.

The book written for this course will be offered for sale to those who do not want to take the MOOC and only wish to read the book.

Holy Apostles will host a dinner on the campus for the seminarians to present their papers under the guidance and introduction of the professors. These talks can be recorded and posted on the website.

Sustainability

The format for this course can be expanded to a similar sister-course focused on the physical, chemical, and cosmological sciences. Both courses can be offered to laity online and on campus. Through online delivery, both courses can be offered to the general public and at other Catholic institutions. The course not only involves the professor, but also professional editors to help with the papers and administrators to maintain the website. We are planning to run the website in conjunction with the Institute of Theological Encounter with Science and Technology (ITEST). We can envision the website as a tool to drive the faith and science dialogue and to provide a role model for youth.

The goal is to change the way Catholics, especially young Catholics, approach the science and faith discussion. Science should never be used to sell faith. Science cannot prove or disprove faith. Faith is not subject to science. Rather, we start with faith. We start with the certainty that God created the universe with a beginning in time, with order, and for humans to safeguard. We see science, the study of God's Handiwork, through eyes illuminated by faith. We can therefore be confident in faith and engage the most current scientific findings because we understand that science is incomplete and an ever-ongoing human effort to discover that Handiwork. Understood in the way, Catholics can evangelize through science and be leaders in science.

About the Instructors

Dr. Stacy Trasancos, Ph.D. is an adjunct professor of Chemistry and President of the Holy Apostles College and Seminary Alumni Association. She holds a doctorate in Chemistry from the Pennsylvania State University and a master's degree in Dogmatic Theology from Holy Apostles. She was a Senior Research Chemist for Senior Research Chemist for E. I. DuPont de Nemours & Co., Inc. Lycra® business. She started, designed, and led two websites for Catholic writers, *Ignitum Today* for young adults and *Catholic Stand* for Catholic citizens. She teaches chemistry and physics for Kolbe Academy and is author of *Science Was Born of Christianity: The Teaching of Fr Stanley L. Jaki*.

Rev. Peter Samuel Kucer, STD, MSA, is the Academic Dean of Holy Apostles College and Seminary and an Assistant Professor. He completed his STD in Systematic Theology from the Catholic University of America in January, 2012. His interests include the relationship of Catholic doctrine to history, politics, economics and scientific reasoning. While teaching he is studying these relationships from the standpoint of stability and change. Another relationship that is of great interest to him is between Catholicism and Judaism again from the standpoint of continuity and change.

Thomas P. Sheahen is a professor of theology and science at Holy Apostles College and Seminary. He holds a Ph.D. in Physics from the Massachusetts Institute of Technology and is Director of the Institute for Theological Encounter with Science and Technology (ITEST).

Rev. Khoa Nguyen, SVD is a member of the Society of the Divine Word. He took his first vows in 2001 and professed perpetual vows in 2007. Ordained to the priesthood in 2008, Fr. Khoa was first assigned to Mexico before serving in several parishes in Fort Wayne, IN and Neptune, NJ for about two years. He has a B.S. from George Washington University in Electrical Engineering, a M.Div. from the Catholic Theological Union, Chicago, IL in World Mission, and a S.T.L. from the Catholic University of America, Washington, DC in Systematic

Theology. His teaching interests include Catholic Theology, Church History, Missiology. He is fluent in Vietnamese, German, some Spanish, reading knowledge of French, Latin and Greek. His intercultural experience includes two years of cross-cultural experience in Austria and two months of missionary experience in Mexico.

Budget

This course is not already offered. In fact, it appears to be a novelty not only in seminarian formation but in college education in both religious and secular institutions overall. There are articles and tutorials about reading scientific papers as extra materials in various courses. Scientific journalism courses provide instruction about reading, analyzing, and communicating scientific works. However, there are no (based on internet research) courses that provide both an in-depth guidance for reading scientific papers and communicating them in the modern faith and science dialogue.

The idea to build a website dedicated to the course to publish the works of the students is also a novel, possibly revolutionary, idea. It is also a highly practical and sustainable idea. As the website is populated with quality works from the students, the benefits of the course become readily accessible to any online reader. The course has a built-in and on-going assessment and marketing character as links to papers are promoted and shared on social media. The course populates the website, which in turn populates the course, thereby giving the course an organic growth and outreach plan.

The goal of the first two semesters is to teach seminarians how to read scientific literature and guide the laity, and to build a website to publish their works. Beyond that, the goal is to expand the course to a second sister-course focused on the physical, chemical, and cosmological sciences. Then the plan is to offer these as continuing education for priests, deacons, and the religious, all the while continuing to populate the course website with content. More broadly, the goal is to extend the offering to theology or philosophy college majors and then as a MOOC to any laity interested in writing or communicating about faith and science. The course builds a community.

Hence, the grant resources are appropriated with the three-tiered goals in mind and focus primarily on instructing seminarians and building the materials, but those efforts will lay a foundation for continued growth.

- \$1,000 for marketing materials, YouTube videos, ads for social media
- \$1,000 for purchasing ads on Catholic websites
- \$1,000 for Populi user fees x 40 seminarians (@\$6 each/month x 4 months)
- \$400 for Adobe Connect license (\$45/month x 8 months)
- \$2,000 to offer tuition discounts to seminarians for this course
- \$1,000 for faculty stipends for additional section of course
- \$600 for additional professional editing services (if needed)
- \$500 for translating services (Some seminarians on campus do not speak English as a first language.)
- \$500 to develop dedicated website for course publications
- \$500 to produce and publish a textbook specific for the course (A proposal will be sent to a publisher. If the publisher offers a contract, the allotment will go toward marketing or tuition discounts.)
- \$500 to develop a MOOC course to offer laity
- \$1,000 for a faculty dinner for seminarians to present their work in the course so as to demonstrate the benefit of this kind of discourse