

Center for Applied Research in the Apostolate
Georgetown University
Washington, DC

Engaging Science in Seminaries

**A Report to the USCCB Secretariat of Clergy,
Consecrated Life and Vocations**



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Executive Summary

In summer 2016, the John Templeton Foundation commissioned CARA to study the intersection of faith and science in the seminaries of six English-speaking nations (United States, Canada, Great Britain, Ireland, South Africa, and Australia). The USCCB Secretariat of Clergy, Consecrated Life and Vocations expressed interest in learning from seminary rectors their assessment of how science and theology are integrated in the seminary curriculum in light of the relevant PPF norms, and in particular their preparation of seminarians as pastoral leaders who are able to address critical questions of science and theology.

CARA contacted seminary rectors at 40 theologates and 28 college level seminaries that operate under the *Program of Priestly Formation* of the U.S. Conference of Catholic Bishops to request their participation in a survey about how their seminaries form seminarians at the intersection of science and religion. CARA also contacted seminary rectors, via email, at 12 seminaries in Australia, 11 in Canada, five in South Africa, four in Great Britain, and two in Ireland with the same request.

The purpose of the survey is to inform the John Templeton Foundation and to assist the USCCB Committee on Clergy, Consecrated Life and Vocations in understanding more clearly how science and theology are taught within the seminary curriculum and integrated into seminary formation.

Major Findings

Academic Faculty and Scientific Topics

- Theologate rectors report an average of ten full-time clergy faculty and seven full-time lay faculty employed by the seminary. College rectors report an average of four full-time clergy faculty and four full-time lay faculty. Both theologates and college seminaries average one clergy faculty and one lay faculty with a background in science.
- Overall, two in three responding rectors report that some faculty members currently conduct research or writing on the intersection of religion and science (e.g., in ontology, bioethics). Theologates are more likely than college seminaries to have a faculty member currently researching or writing in this area. Some of the topics or issues on which faculty members currently research include bioethics, evolution and theology, faith and reason, integrated approaches to the human person, medical ethics, and music and neuroscience.
- More than half of responding seminary rectors identify six of eight scientific topics that are included in their seminary program. Theologate rectors are more likely than college rectors to say they include ontology, cosmology, epistemology, historical theology, applied ethics in science, and bioethics in their program.
- Overall, almost six in ten rectors report that Pope Francis' encyclical "Laudato Si" is included in their current seminary curriculum. Theologate rectors are more likely than college seminary rectors to indicate that the encyclical is included in their current curriculum.

Symposia, Workshops, Guest Lectures on Science and Religion

- One in three rectors report that in the past two years their seminary has held a symposium that explicitly addressed some aspect of the topic of science and religion. College seminaries are slightly more likely than theologates to have held such a symposium in the past two years.
- One in five rectors say that their seminary has held a workshop that explicitly addressed an aspect of the topic of science and religion in the past two years. Theologates are a little more likely than college seminaries to have held a workshop.
- Six in ten seminary rectors report that their seminary has invited a guest lecturer who explicitly addressed an aspect of the topic of science and religion in the past two years. Theologate rectors are a little more likely than college rectors to have invited a guest lecturer.

- Among seminaries who have had a guest lecturer to address some aspect of the topic of science and religion, rectors were more likely to report that the guest lecturer they invited to speak on the topic of science and religion was a scientist/scholar/academician than a religious/Church leader.

Preparing Seminarians to Evangelize

- Overall, seminary rectors are more likely to say that their seminary uses optional courses, rather than the core curriculum, to prepare their seminarians to evangelize in a scientific and technological world by engaging the bigger question of science. Seven in ten use optional courses, compared to six in ten who use their core curriculum and less than half who use extracurricular activities for this purpose.
- Theologate rectors are more likely than college rectors to report using optional courses to prepare seminarians to evangelize in a scientific and technological world engaging the bigger question of science. College and theologate rectors are equally likely to report using their core curriculum or extracurricular means to prepare their seminarians to evangelize.
- When asked how important seminarians' understanding of various scientific topics for is their preparation to evangelize in a scientific and technological world, rectors ranked the understanding of human sexuality and euthanasia of highest importance. Rectors ranked understanding of stem cell research, genetic engineering, Darwinism, scientific method, and Internet technologies as nearly as important.
- Theologate rectors are more likely than college seminary rectors to report that it is "very important" for seminarians to understand euthanasia. By contrast, college rectors are more likely than theologate rectors to rank Internet technologies and scientific method as "very important" for their preparation to evangelize in a scientific and technological world.

Challenges

- College rectors report challenges in preparing seminarians to evangelize, such as "a proper understanding of science itself, including its presuppositions, methods, contributions, limitations and place in our society, as well as both its connection to and independence from faith." Another described the challenge of "keeping updated with rapid and complicated issues on an ongoing basis."
- Theologate rectors also report challenges such as "assisting seminarians to develop a rightly grounded faith in the Gospel and Church in a period of rapid social change and discovery. To properly train faculty and find the extended time needed for seminarians to obtain a thorough philosophical education within the Church's patrimony which has the ability to unify the Church's theology with legitimate developments in science and technology, in one vision, while properly keeping the two sciences distinct."

Introduction

In summer 2016, the John Templeton Foundation commissioned CARA to study the intersection of faith and science in the seminaries of six English-speaking nations (United States, Canada, Great Britain, Ireland, South Africa, and Australia). The USCCB Secretariat of Clergy, Consecrated Life and Vocations expressed interest in learning from seminary rectors their assessment of how science and theology are integrated in the seminary curriculum in light of the relevant PPF norms, and in particular their preparation of seminarians as pastoral leaders who are able to address critical questions of science and theology.

The purpose of the study is to inform the John Templeton Foundation and to assist the USCCB Committee on Clergy, Consecrated Life and Vocations in understanding more clearly how science and theology are taught within the seminary curriculum and integrated into seminary formation.

CARA developed two questionnaires – one for college rectors and one for theologate rectors – in collaboration with a representative from the John Templeton Foundation and the USCCB Secretariat for Clergy, Consecrated Life and Vocations. CARA distributed the questionnaires to all seminary rectors from its contact list of 28 college seminaries and 40 theologates in the CARA *Catholic Ministry Formation Directory* and via email to all seminary rectors in five English-speaking countries: 12 seminaries in Australia, 11 in Canada, five in South Africa, four in Great Britain, and two in Ireland. CARA conducted follow-up with non-respondents by e-mail, fax, and phone to achieve the highest possible response rate.

By the cut-off date of February 15, 2017, CARA received completed surveys from 32 U.S. theologates and 19 U.S. college seminaries, for a response rate of 78 percent among U.S. theologates and 68 percent among U.S. college seminaries. In addition, two theologates from Australia, Canada, and one each from South Africa and Ireland completed the survey, as did one college seminary in South Africa. In total there were seven respondents from these seminaries.

Because these surveys were distributed to all eligible seminaries rather than to a representative sample of seminaries, measures of statistical significance are inappropriate. Statistical significance is based on the premise that a relatively small proportion of cases have been randomly sampled from a population. Due to the relatively high response to the survey among U.S. seminaries, the results presented in this report can be interpreted as representing all U.S. seminaries, not a sample.

Organization of This Report

Part I of the report examines the intersection of science and religion in U.S. college and theologate level seminaries. Results for the other English-speaking seminaries who responded are summarized in Part II of this report.

The questionnaire consisted of 15 closed-ended questions concerning the ways that seminaries engage science in the curriculum and in formation as well as four open-ended questions regarding course examples, other topics, challenges in preparing seminarians, and

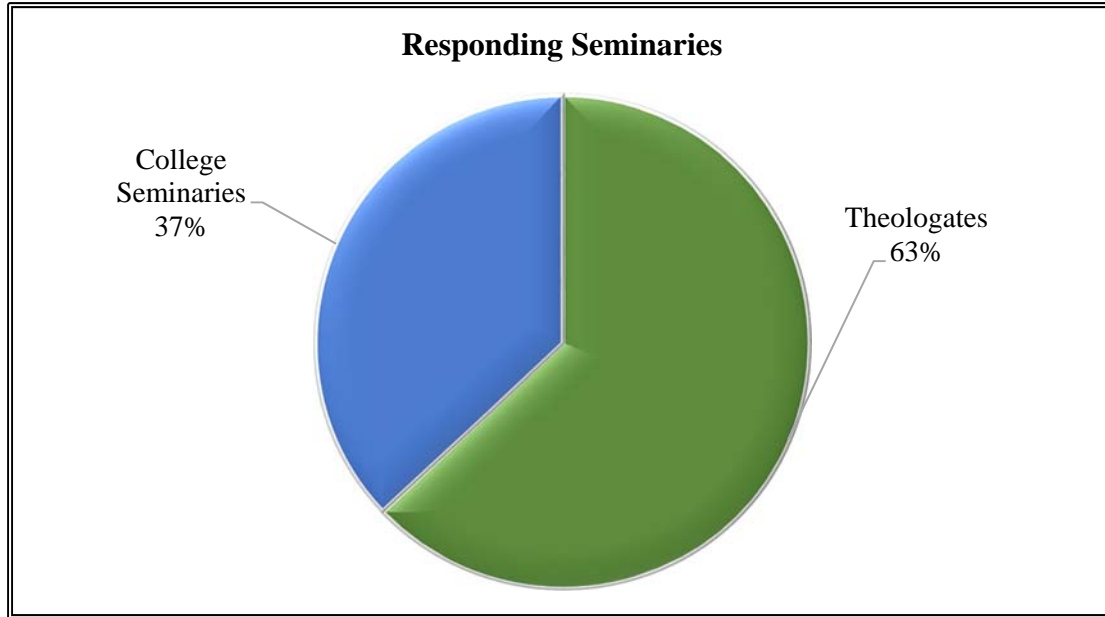
other thoughts regarding the topic of science and religion in Catholic seminaries. The questionnaire for theologates and for colleges was identical but it is likely that seminary formation in this area differs significantly between these two levels of seminary formation. Therefore, the report compares the findings for each of these levels separately.

Part II of the report presents a brief summary of the findings from the seven responding English-speaking seminaries in other parts of the world.

A copy of the original questionnaires with the percentage responses from U.S. theologates and U.S. college seminaries for each closed-ended item, calculated out of 100 percent, can be found in the Appendix. The percentage of non-respondents to each item, calculated separately out of 100 percent, is also shown on the questionnaires in the Appendix.

Part I: Responding U.S. Institutions

Fifty-one U.S. seminaries responded to the survey. Of these, 32 are theologates (63 percent) and 19 are college level seminaries (37 percent), either free-standing or collaborative.



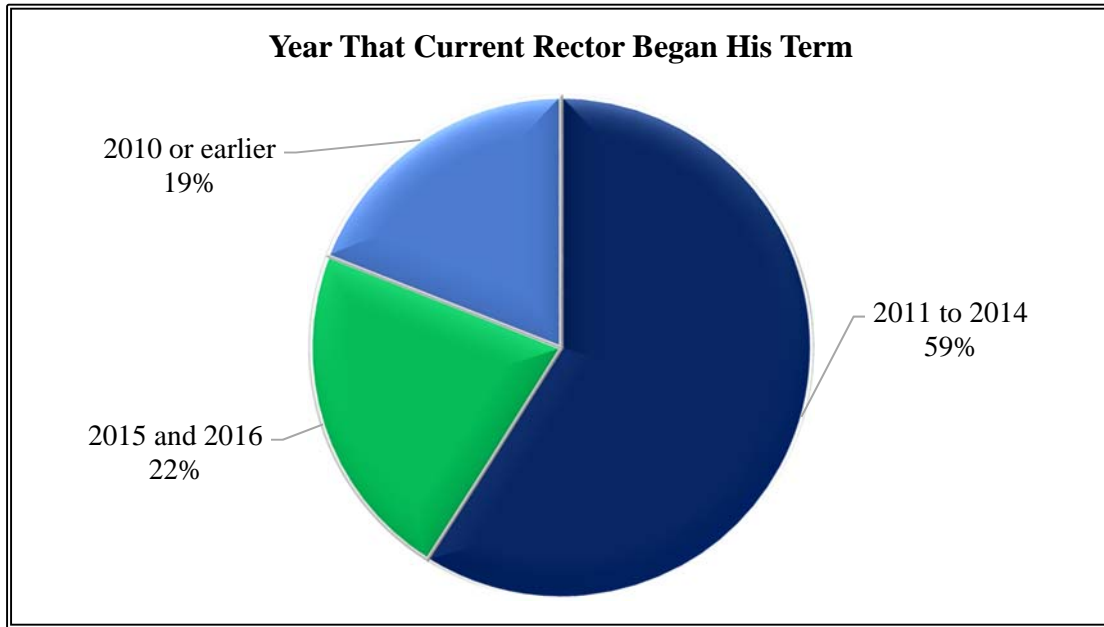
Enrollment

Responding seminaries have an average of 65 seminarians. Half of the seminaries have 55 seminarians or more.

Enrollment of Seminarians			
<i>Mean and median</i>			
	Overall	Theologate	College
Mean	65	80	40
Median	55	78	42

- Theology rectors report that their seminaries have an average of 80 seminarians. Half of them have 78 seminarians or more.
- College rectors report that their seminaries have an average of 40 seminarians. Half of them have 42 seminarians or more.

Seminary Rectors



- Just over one in five (22 percent) report becoming a rector in 2015 or 2016. This group of rectors has served for two years or less.
- Six in ten (59 percent) report becoming a rector in their current seminary between 2011 and 2014. These respondents have served as rectors between two and five years.
- One in five (19 percent) say they were appointed as a rector in 2010 or earlier. Respondents in this category have served as a rector for at least six years.

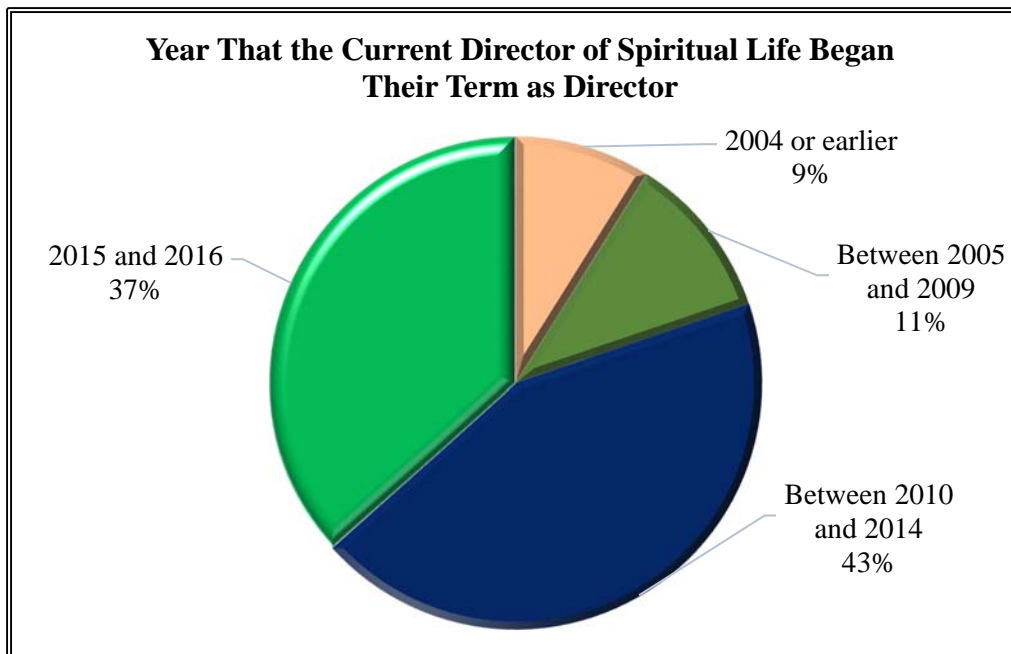
Comparison by Seminary Level

At least half of rectors at the theology and college level started their term between 2011 and 2014.

Year Rector Began His Term		
<i>Percentage responding</i>		
	Theology	College
2010 or earlier	19%	17%
Between 2011 and 2014	59	50
2015 and 2016	22	33

- College rectors are more likely than theologate rectors to report beginning their term as rector in 2015 or later.
- One in five theology level rectors and one in three college seminary rectors began their term within the last two years.

Director of Spiritual Life



- One in ten directors of spiritual life began their term in 2004 or earlier. These directors have served for at least 12 years or more.
- One in ten (11 percent) began their term between 2005 and 2009. These directors have served between seven and 11 years.
- Just over four in ten (43 percent) report becoming director of spiritual life in their current seminary between 2010 and 2014. These directors have served between two and six years.
- Nearly four in ten (37 percent) report that the current director of spiritual life began their term in 2015 or 2016. This group of directors has served for two years or less.

Comparison by Seminary Level

Directors of spiritual life at college seminaries are more likely than those at theologates to have been appointed between 2010 and 2014 (50 percent for colleges compared to 31 percent for theologates).

Year the Current Director of Spiritual Life Began		
<i>Percentage responding</i>		
	Theology	College
2004 or earlier	12%	6%
Between 2005 and 2009	15	6
Between 2010 and 2014	31	50
2015 and 2016	42	38

Overall, half of the seminaries have two or more residential spiritual directors and half have five or more adjunct spiritual directors

Residency of Spiritual Directors			
<i>Mean and Median</i>			
	Overall	Theology	College
Residential (average)	4	5	2
Adjunct (average)	7	7	7
Residential (median)	2	4	2
Adjunct (median)	5	5	6

- Theologate rectors report that their seminaries have an average of five residential and seven adjunct spiritual directors. Half of the theologates have four or more residential and half have five or more adjunct spiritual directors.
- Likewise, college rectors report that their seminaries have an average of two residential and seven adjunct spiritual directors. Half of college seminaries have two or more residential and half have six or more adjunct spiritual directors.

Seminary Faculty

Overall, seminary rectors report that seminaries in the United States have an average of eight full time clergy faculty and six full time lay faculty employed by the seminary. Half of the seminaries have seven or more full-time clergy faculty and half have four or more full-time lay faculty.

Status of Faculty <i>Mean and Median</i>			
	Overall	Theology	College
Full-time clergy (average)	8	10	4
Full-time lay (average)	6	7	4
Full time clergy (median)	7	9	3
Full time lay (median)	4	7	2

- Theologates report that their seminaries have an average of ten full-time clergy faculty and seven full-time lay faculty employed by the seminary. Half of theologate seminaries have nine or more full time clergy faculty and half have seven or more full time lay faculty.
- College rectors report having an average of four full-time clergy and four full-time lay faculty employed by the seminary. Half of college seminaries have three or more full-time clergy faculty and half have two or more full-time lay faculty.

Faculty Background in Science

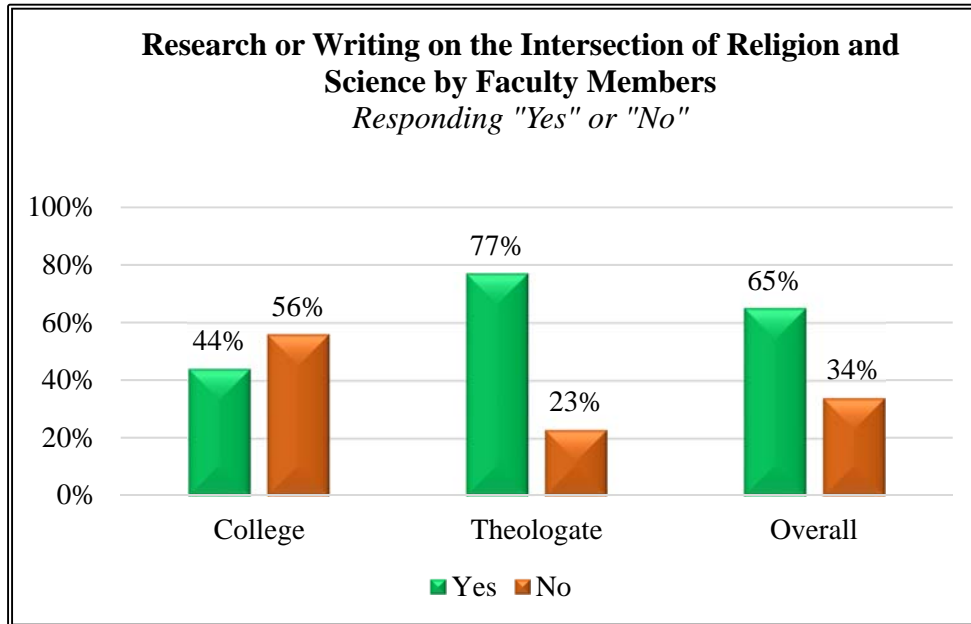
Rectors were asked to list the number of their faculty members with an academic background in science. Responding rectors at both the theologate and college level have an average of one clergy faculty and one lay faculty with a background in science.

Background In Science			
<i>Mean and median</i>			
	Overall	Theology	College
Clergy faculty with background in science (average)	1	1	2
Lay faculty with background in science (average)	1	<1	3
Clergy faculty with background in science (median)	1	1	0
Lay faculty with background in science (median)	0	0	1

- Overall, rectors at either the theologate or college level report one clergy faculty with a background in science and one lay faculty with a science background.
- However, half of the theologate rectors have at least one clergy faculty with a background in science and half have less than one lay faculty with a background in science.
- In contrast, half of college rectors report less than one clergy faculty with a background in science and at least one lay faculty with a background in science.

Faculty Research or Writing on the Intersection of Religion and Science

Overall, two in three responding college or theologate rectors (65 percent) report that some faculty members currently conduct research or are writing on the intersection of religion and science (e.g. in ontology, bioethics). About a third (34 percent) say that none of their faculty members currently conduct research or writing on this aspect.



- Theologates are more likely than college seminaries (77 percent for theologates as compared to 44 percent for college seminaries) to report that some of their faculty members currently conduct research or writing on the intersection of science and religion. Nearly one in four theologate rectors (23 percent) report that none of their faculty members currently conduct research or are writing on this aspect.
- Just under six in ten (56 percent) college rectors report that none of their faculty members currently conduct research or writing on the intersection of science and religion.

Topics or Issues for Current Research/Writing

Rectors were also invited to describe the topics or issues in the intersection of science and religion that their faculty are currently researching or writing on. Their responses include:

Theologate

- Bioethics; gender differences, convergence with scriptures
- Bioethics; evolution and theology

- Bioethics, Ontology, cosmology, human sexual differences, history of the development of science in Catholic Europe, Msgr. Georges Lemaitre
- Biology of Spirit, global climate change
- Cosmology, anthropology, environment
- Cosmology evolution
- Dr. Christopher Anadale, Dr. John Love
- Evolution, Bioethics
- How research method in theology and science mesh
- Many issues of bioethics; e.g. Delayed ensoulment of human embryo
- Epicurean cosmology etc.
- Medical ethics and Catholic health care
- Medical ethics, Bioethics, Genetics, Ecology etc.
- Music and neuroscience, Cosmology
- Our professor of philosophy is our main theologian engaged in this topic
- Pastoral implications: Epistemology
- Religion and science in catechesis and evangelization, History of the Church and scientific discovery, Biblical creation accounts and modern science, Human origins and doctrine of Imago Dei, Creation, Divine Providence
- Science and the new evangelization
- Theology and evolutionary science

College

- College of Science faculty member is a specialist in Bioethics
- Cosmos and creation course development grant
- Faith and reason; integrated approaches to the human person
- I have written and taught in the field of bioethics and recently earned a PhD, in it
- One is pursuing a degree in bioethics
- Philosophical bioethics; theological bioethics; gender
- Philosophy and science

Scientific Topics Included in Seminary Program

From a list of courses, respondents were asked to identify those which were included in their academic curriculum. Overall, about eight in ten seminaries report including epistemology (84 percent).

<i>Which of the following is included into your program?</i>			
Percentage responding "Yes"			
	Overall	Theology	College
Epistemology	84%	87%	79%
Bioethics	70	84	47
Ontology	70	77	58
Historical theology	68	84	42
Social sciences	64	65	63
Cosmology	58	65	47
Natural sciences	44	32	63
Applied ethics in science (other than bioethics)	38	42	32
Other	16	7	32

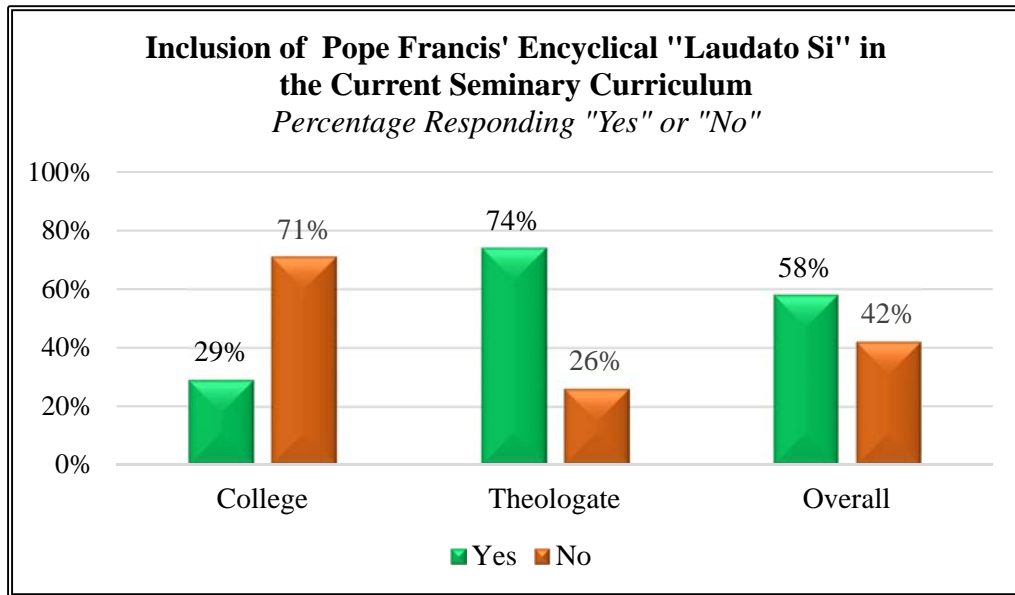
- Seven in ten say bioethics and ontology (70 percent each) are included in their program. About two-thirds report including historical theology (68 percent) and social sciences (64 percent) in their program.
- Nearly six in ten include cosmology (58 percent). About four in ten say they include natural sciences (44 percent) and applied ethics in science (other than bioethics) into their program (38 percent).
- One in six (16 percent) report some other scientific topic included in their program.
- Theology rectors are more likely than college rectors to say they include ontology, cosmology, epistemology, historical theology, applied ethics in science, and bioethics in their program.
- College rectors are more likely than theology rectors to say they include natural sciences and other scientific topics in their program.
- College and theologate rectors are equally likely to say they include the social sciences in their program.

When asked to specify the “other” science topics included in their program, theologate rectors wrote in biology and medical science. College rectors included the following comments:

- Three in sciences, two in ethics
- All our seminarians earn liberal arts degrees, which include the above
- Christian Faith and Management, Education, Medical Field (separate courses)
- Healthcare and Ethics

Laudato Si

Overall, almost six in ten rectors (58 percent) report that Pope Francis’ encyclical “Laudato Si” is included in their current seminary curriculum while just over four in ten (42 percent) say that this encyclical is not included.



Three in four (74 percent) theologate rectors and three in ten (29 percent) college rectors indicate that the seminary curriculum includes Pope Francis’ encyclical “Laudato Si.”

Course(s) That Explore “Laudato Si”

Seminary rectors were asked to describe the courses they offer that explore “Laudato Si”. Their responses include:

Theologate

- Ethics and Environment, Catholic environmental ethics: Sources, Norms and Issues, Ecology and spiritual practice, Ethics, spiritual and global climate change and Biology of Spirit
- Catholic sexual teaching; creation and science
- Catholic social doctrine
- Catholic social ethics
- Catholic social teaching
- Catholic social thought
- Fundamental moral theology
- Fundamental moral theology; theology of ministry
- Moral theology
- Morals; Justice
- MORL602 social justice, PPHL 901 Cosmology, MOR 909 Protology
- MT 508-Catholic Social Teaching
- Pastoral Moral issues; Aquinas on creation, Providence and sin
- Rural Ministry PT 625
- Social doctrine of the Church
- Social ethics
- Social justice; environmental ethics
- Survey of moral topics
- Theology of creation and grace
- Trinity; Catholic social ethics
- The care of Mother Earth, the air and the sea

College

Responding college rectors report the following courses that explore “Laudato Si” are taught at the college level:

- Contemporary Ethical issues
- Ecology and sustainability
- Introduction to moral theology
- Philosophy in nature
- They hold discussions in groups about it on campus

Integration of Science and Religion

Rectors were asked to provide an example of a course in their program that integrates science and religion. Their responses are listed here.

Theologate

- Catholic Morals (Fundamental Morals) Justice Bioethics Pastoral Counseling (2) Introduction to Pastoral Revelation and Core Faith Foundations of Catholic Faith
- Apologetics and Bioethics
- Bio-ethical Issues in Life; Theology of Creation and Grace; Theology of Marriage and Human Sexuality
- Bioethical Dilemmas at the Beginning of Life, Theology of Marriage and Human Sexuality, Health Care and Catholic Morality Addictions, Compulsive Behavior and Recovery, Social Doctrine of the Church
- Bioethics: Bioethics in the Catholic Tradition (core), Modern Church History (core), God, Creation and Evolution (elective).
- Biology of Spirit Ethics, Spirituality, and Global Climate Change to Care for the Earth: Ethics and the Environment, Ecology and Spiritual Practice, Catholic Environmental Ethics: Sources, Norms, and Issues.
- Catholic Bio-Medical Ethics, Christian Anthropology, Catholic Social Ethics
- Catholicism and the Evolving World
- Contemporary Moral Issues; Catholic Social Teaching
- Dr. Lopez on Faith and Science (Templeton grant)
- Forthcoming course elective on Science and the New Evangelization
- Fundamental theology - how method in science can dovetail with method in theology; Bioethics - use of medical information to speak about abortion and various medical treatments.
- Health Care Ethics; Ethics of Human Sexuality
- Liturgical Anthropology, Philosophy and Nature, Philosophical Anthropology, Can the Mind be reduced to its Physiological Basis? Sustainable Agriculture Issues in Divine Action

- Medical Ethics; Environmental Ethics
- MORL801 Medical Ethics; PHIL 400 Darwin & Naturalism; PPHL 901 Cosmology ANSWER TO Question #14: (NOT ENOUGH ROOM) Natural Theology; Protology & Anthropology; Philosophy of Science; Darwin & Naturalism; Pastoral Counseling
- MT 640 Medical Moral Theology MT 740 Selected Issues in Medical Moral Theology, ST 611 Creation and the Human Person, PH 524 Philosophy of Knowledge
- Only Wonder Comprehends: Faith and Science
- Our seminarians take classes at the various pontifical universities in Rome. All of them cover the intersection of science and religion in both fundamental theology and in moral theology.
- Pastoral Psychology, Catholic Sexual Teaching, Healthcare Ethics, Creation and Science
- Philosophy of Nature, Cosmos and Creation
- Philosophy of Science, Bioethics, Sexual Ethics, Theological Anthropology, Fundamental Theology, Theology of Thomas Aquinas
- Rural Ministry PT625
- Science and Forgiveness
- Science and the Brain: Ritual and Mysticism. This course was developed through a grant from the Templeton Foundation.
- The Emergence of the Image: Human Evolution from Scientific, Philosophical and Theological Perspectives
- Theology and Cosmology, Theological Anthropology, Catholic Social Ethics
- What is a Human Being? Evolution's Gift to Theology for Responding to this Question

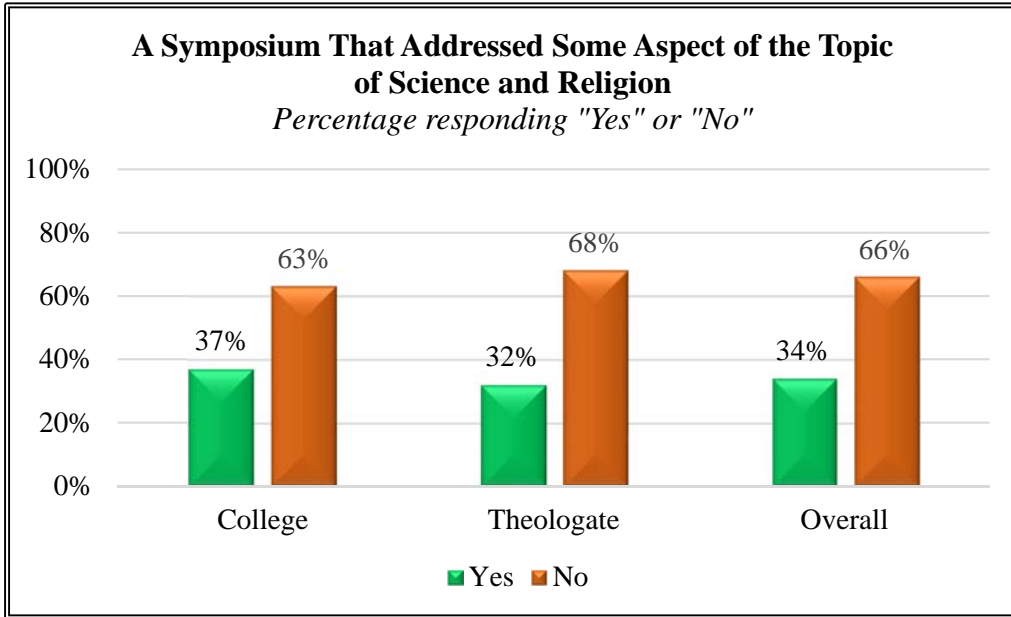
College

- All courses are taught at the university, not here at [the seminary]
- Bioethics, philosophy of science
- Environmental Science, Anthropology - Study of Human Origins

- Our seminarians study at Providence College, where these types of courses are taught, but the seminary does not have them.
- Our Seminary is one of Formation. Academics are pursued in collaboration with Duquesne University. Duquesne University has sponsored the following workshop: Integrity of Creation Conference - Protecting our Common Home: Scientific Contributions & Religious Perspectives
- Philosophy of Nature Fall '17 Cosmos and Creation
- SCI102 Life Sciences; THL321 Religious Perspectives on Social Issues; THL322 Catholic Social Teaching; ENV170 Environmental Science; BIO327 Behavioral Ecology; SOC210 Sociology and Religion; PSY355 Psychology of Religion; a central part of our chemistry & biology focus is on green chemistry & green science.
- Science, Faith and Knowledge
- Science: A Theology of Creation; Physics and Philosophy; Epistemology; Philosophy of the Human Person; Life and Death Issues
- Science: A Theology of Creation; Physics and Philosophy; Epistemology; Philosophy of the Human Person; Life and Death Issues
- THEO 459 Theology and the environment, THEO 434 Science and Theology, THEO 437 Christian Faith and health care, THEO 420 Theology and Biomed revolution

Symposia on the Topic of Science and Religion

Overall, one in three rectors (34 percent) report that their seminary has held a symposium in the past two years that explicitly addressed an aspect of the topic of science and religion.



- Almost four in ten college seminary rectors (37 percent) and one-third of theologate rectors (32 percent) report that in the past two years their seminary has held a symposium that explicitly addressed some aspect of the topic of science and religion.
- Nevertheless, most seminaries (68 percent of theologates and 63 percent of college seminaries) did not have a symposium in the past two years addressing an aspect of the topic of science and religion.

Symposium Titles

Rectors indicating that their seminary has held a symposium that addressed some aspect of the topic of science and religion report the following symposium titles:

Theologate

- Advance Not Alteration: Biological Evolution as an Analogy
- An Ecumenical and Interfaith Convocation: Celebrating Pope Francis' Encyclical "Laudato Si"
- Br. Guy Consolmagno and the Vatican Observatory
- Changing Cosmologies

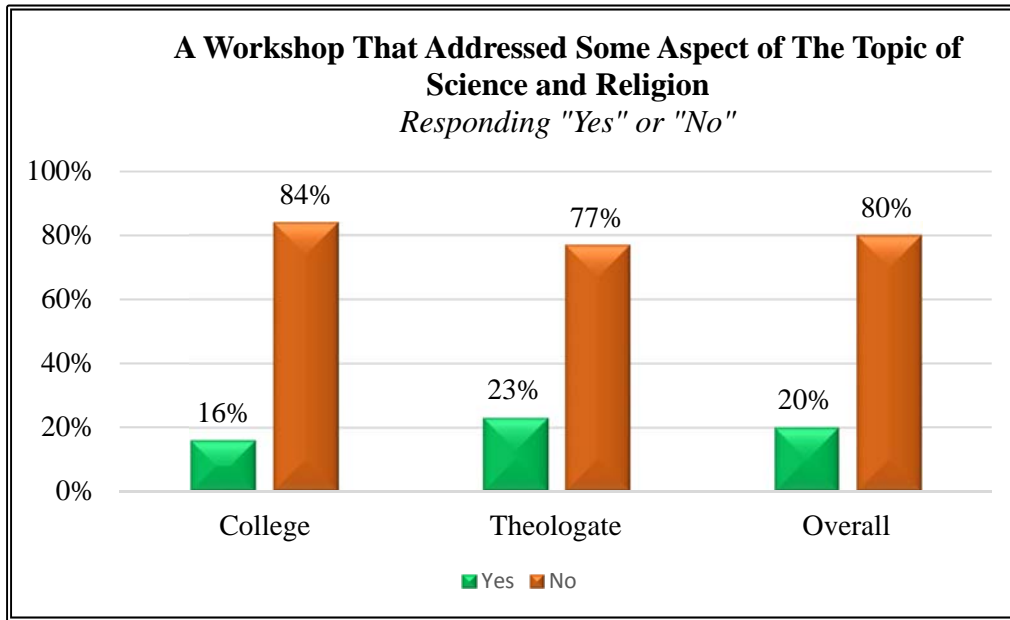
- God's Universe: The Catholic Church and Science in a New Era
- Laudato Si
- Physics and Faith; NFP center
- Science and the Brain

College

- Faith and Science
- *Fides et Ratio*
- Fr. Nicanor Austriaco, OP, Presented on "Faith and Reason"
- Theology and evolution, science and the big questions

Workshop(s) on the Topic of Science and Religion

Overall, most rectors (80 percent) report that their seminary has not held a workshop in the past two years that explicitly addressed some aspect of the topic of science and religion. One in five (20 percent) report having one or more workshops addressing topic.



- Nearly one in four (23 percent) theologate rectors and one in six (16 percent) college seminary rectors report that their seminary has held a workshop that explicitly addressed an aspect of the topic of science and religion.
- Just over eight in ten (84 percent) college rectors and nearly four in five (77 percent) theologate rectors report that their seminary has not held a workshop addressing this topic.

Workshop Titles

College or theologate rectors responding that their seminary has held a workshop which addressed some aspect of the topic of science and religion report the following workshop titles:

Theologate

- Biology and Theology: Making the Soul Connection
- Faculty seminar on Laudato Si and the Environment
- Forthcoming in 2017
- Imagination and Cooperation in the Care for Our Common Home
- Only Wonder Comprehends Faith and Science

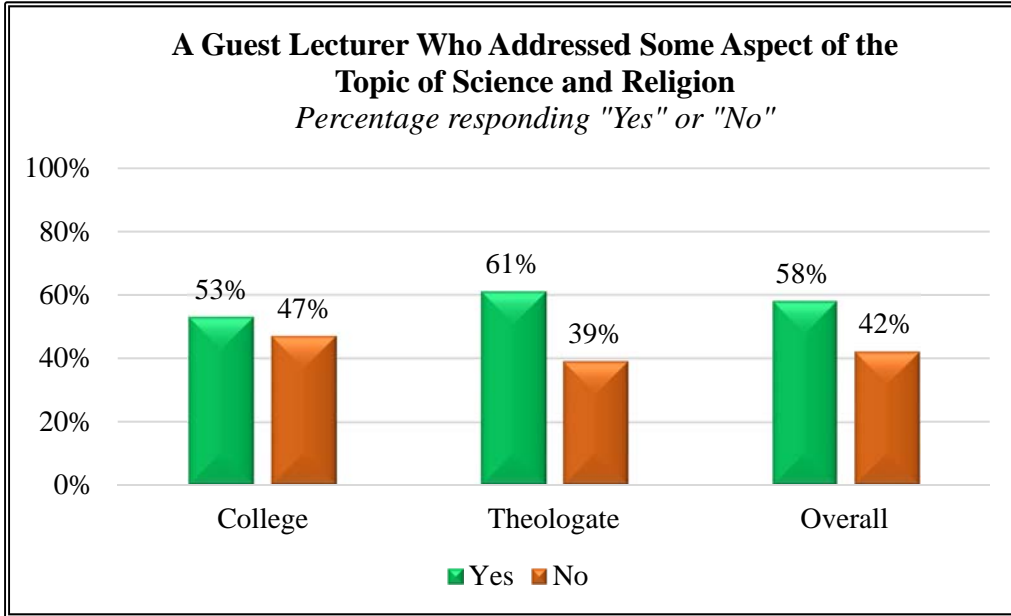
- Science and Mysticism
- The Spirituality of Teilhard de Chardin

College

- Academics are pursued in collaboration with Duquesne University where the following workshops were held: Integrity and creation conference, Protecting our common home, Contributions and Religious Perspective
- Evolution
- In spring 2017, one will be scheduled on Cosmos and Creation
- Panel/discussion on Laudato Si

Guest Lecturer

Overall, just under six in ten (58 percent) college or theologate rectors report that in the past two years their seminary has invited a lecturer who explicitly addressed some aspect of the topic of science and religion. Slightly more than two in five (42 percent) report that they did not invite a lecturer within this period who addressed this topic.

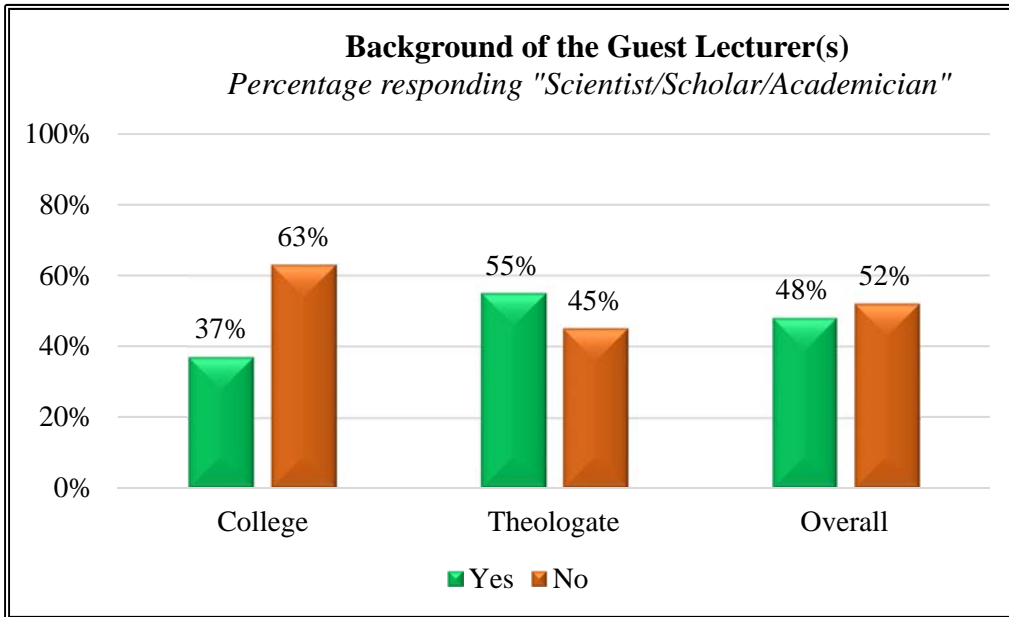


- Six in ten theologate rectors (61 percent) and just over half of college rectors (53 percent) report that their seminary has invited a guest lecturer who explicitly addressed an aspect of the topic of science and religion.
- Nearly half of college seminary rectors (47 percent) and four in ten theologate rectors (39 percent) report that their seminary has not had a guest lecturer who addressed this topic.

Background of Guest Lecturer(s)

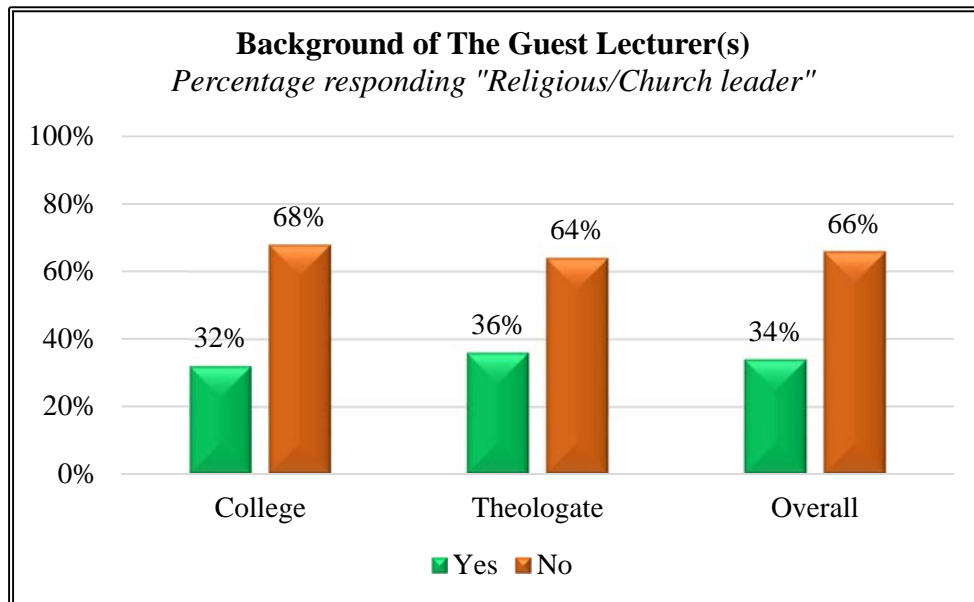
Among seminaries who have had a guest lecturer to address some aspect of the topic of science and religion, rectors were more likely to report that the guest lecturer they invited to speak on the topic of science and religion was a scientist/scholar/academician than a religious/Church leader.

Overall, almost half of responding seminary rectors (48 percent) say that the guest lecturer(s) they invited in the past two years to give a lecture on the topic of science and religion was a scientist/scholar/academician.



- Almost four in ten college rectors (37 percent) report having invited guest lecturer(s) who were scientists, scholars, or academicians to give a lecture on the topic of science and religion.
- More than half of theologate rectors (55 percent) report that the guest lecturers they invited in the past two years to give a lecture on the topic of science and religion had a background either in science, scholarship, or academia.

Fewer respondents, 34 percent overall, report that the guest lecturer(s) they invited to their seminary in the past two years to give a lecture on the topic of science and religion was a religious/Church leader.



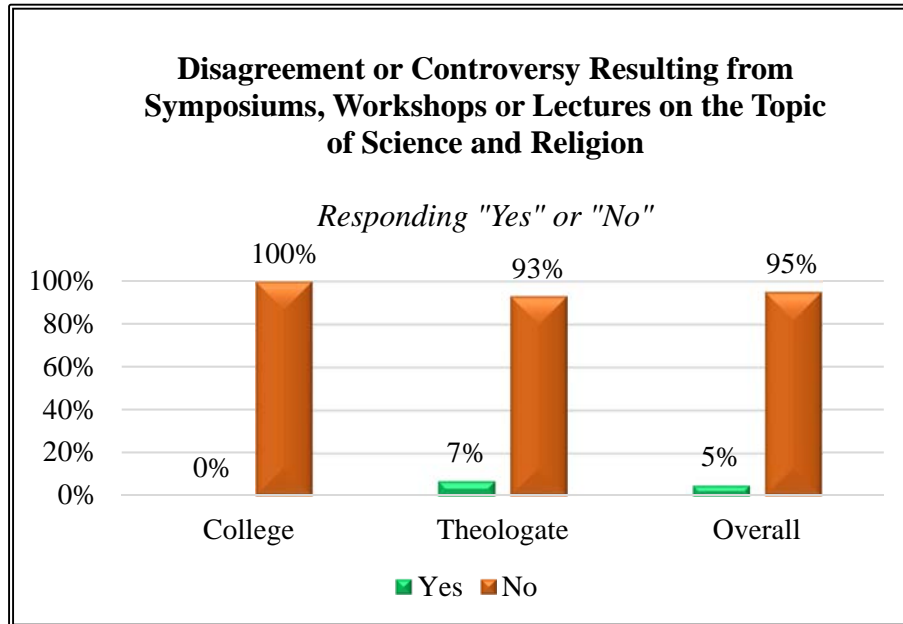
- More than a third of theologate rectors (36 percent) report that the guest lecturer(s) invited in the past two years to give a lecture on the topic of science and religion were either religious or a Church leader.
- A third of college rectors (32 percent) say the guest lecturer(s) invited in the past two years to give a lecture on the topic of science and religion were religious or a Church leader.

Apart from scientist/scholar/academician or religious/Church leader, 6 percent of rectors overall report that invited guest lecturers had the following backgrounds:

- Medical doctors
- Virtuous business leadership
- Br. Guy Consolmagno, SJ forthcoming in 2017
- Fall '17 and Spring '17, two are scheduled
- In the thicket of the world doing science as a person of faith

Disagreement or Controversies Arising from Symposia or Workshops

Responding to the question whether any of the symposia, workshops or guest lectures described above caused disagreement or controversy at the seminary, almost all rectors (95 percent) report that none of the issues or topics discussed in the symposia or workshops caused disagreement or controversy at the seminary.



- All responding college seminary respondents communicate that none of the issues or topics discussed at the symposiums or workshops caused disagreement or controversy at the seminary.
- About nine in ten (93 percent) theologate respondents say that none of the issues or topics discussed in the symposiums or workshops at their seminary caused disagreements or controversies in the seminary.

Topics or issues that caused disagreement or controversy in theologates were:

- Bio evolution; Aristotelian PH
- Some of the speakers were terrible

Preparing Seminarians for Evangelization

Overall, seminary rectors are more likely to say that their seminary uses optional courses, rather than the core curriculum, to prepare their seminarians to evangelize in a scientific and technological world by engaging the bigger questions of science. Seven in ten use optional courses, compared to six in ten who use their core curriculum and less than half (48 percent) who use extracurricular activities. One in 10 account for other means by which seminaries prepare their men to evangelize in a scientific and technological world.

<i>Through which means does your program (if any) prepare men to evangelize in a scientific and technological world by engaging the bigger questions of science?</i>			
Percentage responding “Yes”			
	Overall	Theology	College
Optional courses	70%	74%	63%
Core curriculum	62	61	63
Extracurricular (e.g. invited lecturers)	48	48	47
Other	10	3	21

- Theologate rectors are more likely than college rectors to report using optional courses (74 percent for theologates as compared to 63 percent for college level) to prepare seminarians to evangelize in a scientific and technological world by engaging the bigger questions of science.
- College and theologate rectors are equally likely to report using their core curriculum (61 percent for theologates and 63 percent for college seminaries) or extracurricular means (48 percent for theologates and 47 percent for college seminaries) to prepare seminarians to evangelize in a scientific and technological world by engaging the bigger questions of science.

Among the “other” means that seminary rectors say they use in preparing seminarians for evangelization they list:

- Formation workshops
- In collaboration with Duquesne University
- Philosophy of Science; God & Philosophy
- Programs sponsored by the University of St. Thomas
- Sustainability committee

Important Topics for Preparing Seminarians to Evangelize

Seminary rectors were asked to reflect on the importance of seminarians’ understanding of several scientific topics to their preparation to evangelize in a scientific and technological world. They were then asked to rank each topic on a scale from 1 (not important) through 4 (neutral) to 7 (very important).

Theologate

When asked how important is seminarians’ understanding of various scientific topics for their preparation to evangelize in a scientific and technological world, theologate rectors ranked the understanding of human sexuality and euthanasia of highest importance. More than half of rectors ranked each of these items as 7, meaning “very important.”

<i>How important is seminarians’ understanding of the following topics to their preparation to evangelize in a scientific and technological world?</i>			
Among Responding Theologate Rectors			
	Percent “Very Important”	Mean Rank	Median Rank
Human sexuality	82%	6.68	7
Euthanasia	68	6.55	7
Stem cell research	42	6.23	6
Genetic engineering	40	6.13	6
Darwinism	21	5.58	6
Internet technologies	19	5.41	6
Psychology of religion	11	5.20	5.5
Scientific method	26	5.39	5
Sociology of religion	11	5.03	5
Behaviorism	14	4.76	5
Climate change	16	4.71	5
Artificial intelligence	8	4.63	5

- Just over eight in ten rectors ranked seminarians’ understanding of human sexuality (82 percent) as “very important” for their preparation to evangelize in a scientific and technological world. Euthanasia was ranked as “very important” by more than two in three (68 percent).
- Half of seminary rectors ranked seminarians’ understanding of stem cell research, genetic engineering, Darwinism, and Internet technologies as either 6 or 7 on a 7-point scale. Between one in five and two in five ranked each of these as 7 “very important” for seminarians’ preparation to evangelize in a scientific and technological world.

- Psychology of religion and scientific method are ranked by rectors substantially above the midpoint on this list of topics. Half of rectors rated psychology of religion as 5.5 or higher on a 7-point scale and about a quarter of rectors rated scientific method as 7 or “very important” for seminarians’ preparation to evangelize in a scientific and technological world.
- Half of rectors rated as 5 or higher (“somewhat” to “very” important) the following topics: sociology of religion, behaviorism, climate change, and artificial intelligence.

College Seminaries

Similar to theologate rectors, when asked how important is seminarians’ understanding of various scientific topics for their preparation to evangelize in a scientific and technological world, college seminary rectors ranked the understanding of human sexuality and euthanasia of highest importance. More than half of rectors ranked each of these items as 7, meaning “very important.”

How important is seminarians’ understanding of the following topics to their preparation to evangelize in a scientific and technological world?
 Among Responding College Rectors

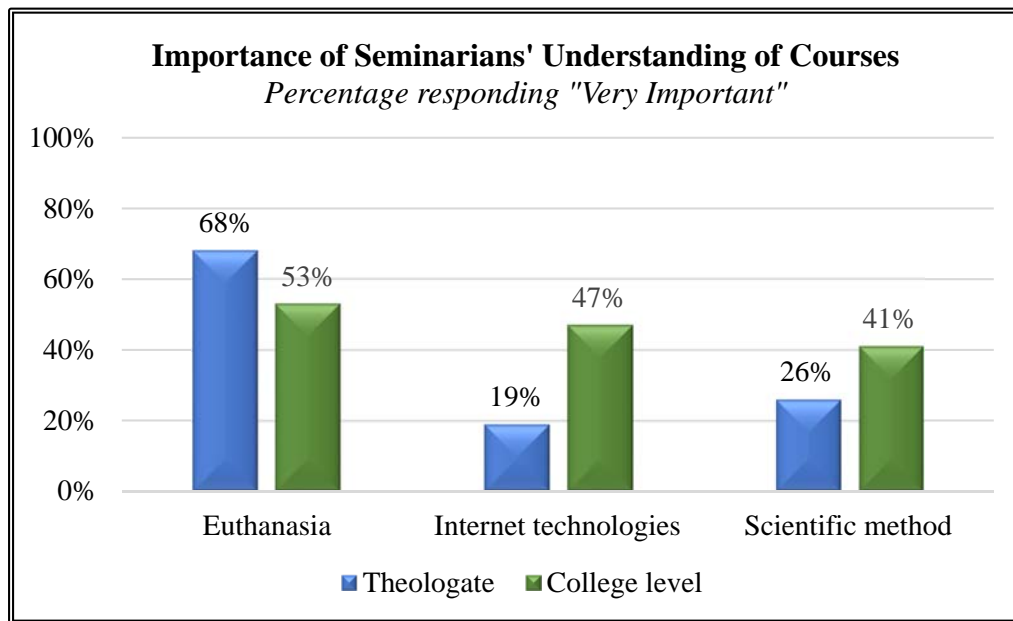
	Percent “Very Important”	Mean Rank	Median Rank
Human sexuality	77%	6.71	7
Euthanasia	53	6.35	7
Stem cell research	35	5.94	6
Genetic engineering	29	5.76	6
Scientific method	41	5.71	6
Internet technologies	47	6.18	6
Darwinism	24	5.35	5
Psychology of religion	12	5.06	5
Sociology of religion	18	5.00	5
Climate change	6	4.94	5
Behaviorism	12	4.76	4
Artificial intelligence	6	3.88	4

- More than three in four college rectors (77 percent) report that seminarians’ understanding of human sexuality is “very important” for their preparation to evangelize in a scientific and technological world. More than half (53 percent) rank euthanasia as highly.

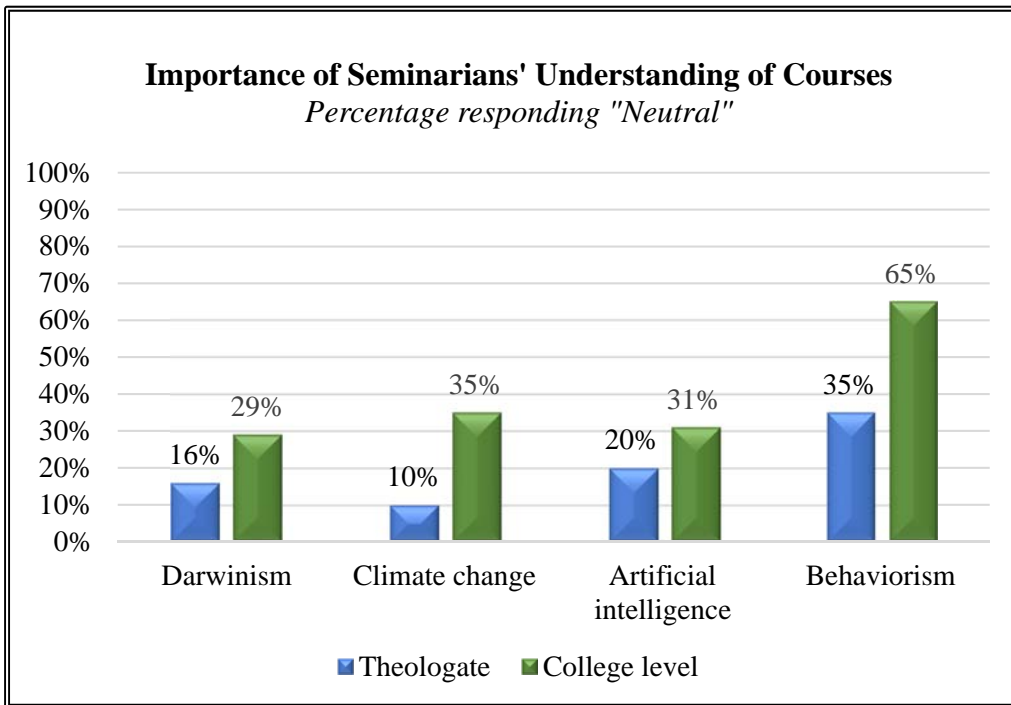
- Between three in ten and almost half rank Internet technologies, scientific method, stem cell research, and genetic engineering as “very important” topics for seminarians to understand in their preparation to evangelize in a scientific and technological world. Half or more rank each of these as a 6 on a 7-point scale of importance.
- Half or more college seminary rectors rank seminarians’ understanding of Darwinism, sociology of religion, psychology of religion, and climate change as at least “somewhat important” in their preparation to evangelize in a scientific and technological world. Between one in four (Darwinism) and one in 20 (climate change) rank each of these as “very important.”
- College rectors see behaviorism and artificial intelligence as a little less important. Half rank these two topics as “neutral” to “not important.” Just over one in ten (12 percent) rank behaviorism as “very important” and about one in 20 ranks artificial intelligence as “very important” for seminarians in their preparation to evangelize in a scientific and technological world.

Comparison by Seminary Level

Theologate rectors are more likely than college seminary rectors to report that it is “very important” for seminarians to understand euthanasia (68 percent for theologates compared to 53 percent for college). By contrast, college rectors are more likely than theologate rectors to rank Internet technologies and scientific method as “very important” for their preparation to evangelize in a scientific and technological world.



College seminary rectors are more likely than theologate rectors to report being “neutral” on the importance of seminarian understanding of behaviorism, artificial intelligence, climate change, and Darwinism for their preparation to evangelize in a scientific and technological world.



Other Topics or Issues on Science and Religion That Are Important to Good Preparation

Rectors were asked to describe other topics or issues on the intersection of science and religion that are important to good preparation of the seminarians. Their responses are presented here, with theologate rectors' comments presented first, followed by those from college seminary rectors.

Theologates

Responding theologate rectors add the following to the list of topics or issues on the intersection of science and religion that are important to good preparation of the seminarians.

- The philosophical notion of "science" and how this differs from the common conception of science in larger society. The natural "faith" and assent given to science; ways in which this is analogous to religious, supernatural faith. The certitude of faith vs. the certitude of science.
- The relationship of general knowledge about nature and mobile being to a more specific knowledge of the same and the consequent certitude acquired by these two kinds of knowledge, greater of general, less of specific. Different modes of argumentation of which the scientific method is only one, and a consideration of the strengths and weaknesses of these modes (traditionally considered in logic courses) The importance of a sound general understanding of nature and mobile being (which is first based on common experience, rather than private lab experience) in reasoning to God's existence and attributes (traditionally considered in natural philosophy).
- 1) Epistemology of science, faith, and rationalism 2) Intersection of methodologies of science, psychology, sociology, philosophy and theology 3) The cosmological and metaphysical implications and integration of the scientific world view and religious world view.
- A major area of importance is that good scientific research is not at odds with good theological study. As is taught in bioethics classroom, "Good medicine is good morals."
- A proper Christian anthropology; To introduce students to the history of the development of the natural sciences; To explicate the Christian theology of creation; To communicate the Papal Magisterium of the 19th, 20th, and 21st centuries on creation and science; To clarify the structure of the scientific method and its relationship with method in theology; To introduce the fundamentals of Big Bang Cosmology, Biblical Cosmology, the Theory of Evolution, and Climate Science.
- Astrophysics.
- Cosmology, medical technology, evolutionary biology.

- Environmental stewardship; critical thinking and the nature of reason as an overarching, unifying view; openness to competing views; overcoming both scientism and fideism and seeing the interrelation of both science and faith; the value of quiet/reflection/solitude/personal relations in a "plugged in", "24/7", technological world.
- Faith and reason within a scientific context Critical issues in Bioethics: Euthanasia and End of Life issues.
- Having a literacy in science is important. It is also important that they be helped to find ways to keep abreast of major developments in science, even if it means just reading an article or two from something like National Geographic.
- Minimally, a basic orientation to the complementarity of science and religion e.g. John F. Haught's text: Science and Faith: An Introduction. Ideally, special topics could be treated e.g. Science and a Personal God; Faith and Evolution/ Christian Anthropology; Creation, Evolution and the Purpose of the Universe; Is There Life after Death? Can Chemistry Explain Life?, Issues of, Mental and Physical Illnesses and Their Ethical /Spiritual Dimensions.
- Pastoral ministry to scientists and those working in scientific fields.
- Population studies.
- Sociological Methods Surveys, Gender Issues and Ecology.
- The biochemistry of addiction/ pleasure and pain, how religious practice affects/is affected by it and what we do about that.
- The proper interpretation of scripture from a Catholic (non-fundamentalist) point of view.
- There is a real need to explore the significance of scientific methodology and findings to the practice of theology and pastoral ministry. So much energy has been applied to the apologetics exercise of trying to "defend" theology from the attacks of atheists (who often claim to use scientific reasoning), or to exposing the false claim that science has no need for a religious/metaphysical grounding, that we are neglecting the rich contribution that science can provide to the practice of theology.
- Understanding of science as non-threatening to faith.
- While this survey is concerned with theology programs, it is the strength of the philosophical foundation that our men find most useful in engaging truth claims from science. Also contributions from psychology and medical science in informing a Catholic response to gender ideology.

College Seminaries

Responding college seminary rectors add the following to the list of topics or issues on the intersection of science and religion that are important to good preparation of the seminarians.

- All of the lab sciences with regard to God's Creation. Social issues compared to Catholic Social Teaching (area of sociology).
- Environment & Environmental Ethics (both offered at our seminary)
- Applied bioethics - end-of-life decisions, physician-assisted suicide with a better understanding on why palliative care is a sufficient, reasonable and essential alternative, etc.
- Environmental stewardship; critical thinking and the nature of reason as an overarching, unifying view; openness to competing views; overcoming both scientism and fideism and seeing the interrelation of both science and faith; the value of quiet/reflection/solitude/personal relations in a "plugged in", "24/7" technological world.
- Evolution Notions of Causality.
- Faith and Reason Higher and Lower Viewpoints.
- God questions in the Big Bang theory, the philosophy of person and scientific Inquiry.
- Healthcare/medical ethics, the relevance of Church teaching with advancement in science.
- Relationship of faith and reason.
- Their compatibility as avenues to truth (a la Dei Filices of Vatican I)
- Theological anthropology, without which faith and reason cannot easily or correctly be integrated.
- To familiarize theology with the presumptions of scientism so they can critically address them.

Challenges to Preparing Seminarians to Evangelize in a World Shaped by Science and Technology

Another open-ended question asked seminary rectors to reflect on the biggest challenge they face in preparing seminarians to evangelize in a world that is shaped to a considerable extent by science and technology. Their responses are presented here, with theologate rectors' comments presented first, followed by those from college seminary rectors.

Theologates

In preparing seminarians to evangelize in a world that is shaped to a considerable extent by science and technology, theologate rectors identify the following as the biggest challenge:

- To assist them in developing a rightly grounded faith in the Gospel and Church in a period of rapid social change and discovery. To properly train faculty and find the extended time needed for seminarians to obtain a thorough philosophical education within the Church's patrimony which has the ability to unify the Church's theology with legitimate developments in science and technology, in one vision, while properly keeping the two sciences distinct.
- A lack of an ability within the hegemonic culture to engage in philosophy or religion in an intellectual or responsible manner.
- A proper understanding of science itself, including its presuppositions, methods, contributions, limitations and place in our society, as well as both its connection to and independence from faith.
- Authentic, humble witness. They don't need to be scientists, but rather evangelists.
- Awareness of how technological milieux shape our perception of the person, creation, interaction, and thought.
- Faculty have limited familiarity with science, and with cutting edge developments. Topics like genetics, gender, ecology, astronomy, etc. have exploded faster than theology has responded. Resources are scarce.
- Helping students appreciate that science is important to their ministry.
- I don't know what they have come in with, and the PPF does not mention the topic, and bishops and superiors do not want to extend training over four years if something were in place.
- I think the biggest challenge is presenting the Gospel and its teachings and implications in a manner that is credible of an increasingly well-educated and critical body of Catholic faithful.

- I think the biggest challenges in preparing seminarians to evangelize in a world that is shaped to a considerable extent by science and technology are: 1) Past misunderstandings of scripture and forms of creation and eschatology (e.g. "special Creation") have set science and faith in opposition to one another, and/or set science off as irrelevant. 2) Generally Church leaders, many theologians, and formation directors have a very limited exposure to the value of engaging science and religion in a positive and useful manner, and thus fail to promote this. 3) The M.Div. requirements in Roman Catholic seminaries leave little room for these kinds of courses.
- Inadequate preparation at college level.
- Integration of science into seminary curriculum is difficult when faculty and students have an educational focus on liberal arts. There is a bias against applicants with degrees in science. The rapid change in scientific knowledge and technological advances makes it difficult to keep up.
- Lack of scientific vocabulary and awareness of scientific method, role of the Church in shaping modern science.
- One of the challenges is to help students locate a prudent balance of response between the extremes of fideism and positivism. Additionally, it is difficult (but not impossible) to find balanced texts on science and faith that are intellectually accessible to the seminarian.
- Polarization of thought.
- Recognizing and realizing the struggles and challenges of evangelizing in the context of an overriding scientific and technological paradigm in today's society. Equipping the seminarians to confront the problem of "scientific" atheism.
- Seminarians have to learn to avoid extremes such as thinking that theology has all the answers and doesn't need science (at least implicitly), or thinking that science has all the answers and that theology is just speculation.
- Tendency toward scientific materialism in the general population which becomes a philosophical barrier to true evangelization as they are both materialists and relativists. We must provide a realist framework for sciences so that they can become open to evangelization. Need to move them to the idea that truth transcends matter.
- The biggest challenge is completing all of the requirements of the PPF. There's little room for any more classes that touch on science and theology.
- The biggest challenge is how technology has become a substitute for human relationships.

- The biggest challenge is the basic scientific illiteracy of many incoming seminary students. Students at my institution have rarely had more than a general college course in science, and most are completely ignorant of the basic tenets of the quantum world or modern genetics. A second challenge is that many such students do not feel a need to remedy that ignorance, nor do they see scientific literacy as a key component for the practice of pastoral ministry.
- The blindness of the secular world with respect to a general trusting acceptance of the conclusions of "science," when such conclusions are by no means absolute or certain, contrasts greatly with the critique of religion in a technological age. To a certain extent, most people now believe (with a misplaced natural faith) that most of life's most searching questions, even questions about existence and spiritual realities, can be resolved by scientific means.
- The rapid pace of medical technology and reproductive life and end of life issues.
- They are overwhelmed in the curriculum. They are also hyper-focused on the "orthodoxy status" of instructors and people to whom they are or hope to be ministering. This issue distracts them from exploring questions which might lead them outside of this "orthodoxy box." Helping seminarians to develop academic confidence requires time and "scientific research" in that they must be encouraged (required?) to develop good research skills.
- They lack, as "technology natives" a critical distance to fully appreciate the dehumanizing impact of social media in particular, and the diminishment of the capacity for authentic friendship due to immersion in the digital realm.
- Trying to find scientists who value the role of theology and religion. Many are professed atheists and do not value spirituality or theological discourse.
- The biggest challenge may be the recently popular attitude among some in this country that scientific findings are to be considered less important than one's own political or cultural agenda, i.e. if science does not support your point of view than it is to be dismissed out of hand.

College Seminaries

In preparing the seminarians to evangelize in a world that is shaped to a considerable extent by science and technology, college seminary rectors mention the following as the biggest challenge:

- A proper understanding of science itself, including its presuppositions, methods, contributions, limitations and place in our society, as well as both its connection to and independence from faith.

- A seminarian should be able to appreciate and make use of science and technology without fear, while at the same time recognizing its limits and its danger when it is divorced from God. The men need to express that faith is not in opposition of science, but also that science does not provide the answers to everything.
- Affirming science and technology while recognizing the distortions and inherent limitations; avoiding the too easy integration of faith and science; avoiding the divorce of faith and science.
- As science presents challenges such as genetic engineering and medical advances that conflict with Church teaching, it's important to educate seminarians on all sides of the issue. In a culture that is not very science-savvy, it's imperative that seminarians know the arguments that science "teaches" alongside the magisterium.
- Church teaching on the dignity of the human being and the use of technological advances, i.e. medicine, medical procedures, and Internet influence on the faithful.
- Having sufficient time to deal with science courses.
- Keeping updated with rapid and complicated issues on an ongoing basis.
- Lack of consistent scientific method in favor of ideology, especially in areas of gender theory (being imposed without scientific evidence).
- Learning how to speak to various disciplines with some understanding and conviction.
- Recognizing what Pope Benedict XVI called "creative reason", which acknowledges the transcendent nature of the human person and how faith and reason work together in helping man to discover the truth about the world and himself, and ultimately, God.
- The biggest challenge is helping the seminarians understand the role that science and technology play in our lives. It is easy for seminarians to be dismissive of courses in the natural sciences because it "won't help them for ministry" and for them to presume that they already know enough about technology. Getting them to understand the need for an appreciation of the natural sciences and reflection on how technology is used in their lives is vitally important.
- The rapid pace of discoveries and how to remain updated.
- There may be a tendency to believe that science and technology have all the answers to life's issues and problems or an understanding of world views

- They are so immersed in technology that it is difficult for them to step back and see the big picture, to be aware and objective, to have a doctrinal take on things, to see beyond the sound bite. Due to diverse perspectives on truth in our secular world, it is easy for them to get drawn into a relativistic view of reality.
- They need to be conversant in those areas so they can critically and theologically address them.
- To have a well-developed and healthy relationship with Christ.
- Understanding both the considerable advantages and benefits provided by science and technology and the intrinsic limits thereof.

Other Thoughts Regarding the Topic of Science

A final open-ended question asked seminary rectors for any other thoughts regarding the topic of science and religion in Catholic seminaries. Responses to this item are listed here with minimal editing as follows:

Theologates

- Already the seminary programs are over-burdened and it seems that we keep increasing the load and the demands on limited time and resources. The seminary cannot be an institution that prepares everyone to do everything as important or worthy as these projects might be.
- Although I reported fairly bleak statistics in this survey, we have just introduced an entire Pre-Theology course devoted solely to the topics of the faith/science dialogue. I am confident that the fruits of such classes will increasingly "filter up" through the theology classes. We are in this for the long haul and it will take determination, patience, and persistence.
- Although it may seem that our faculty has not been engaged with the topic, our friars and some of our faculty and students have started a discussion on the topic of evolution (see <http://www.thomisticevolution.org/>), and some of our students have been attending ecumenical seminars on the intersection of faith and science. We currently have two students with doctorates in physics in formation, as well as a doctorate in mathematics, a doctorate in economics, someone with a graduate degree in biology, another who was a government inspector of nuclear facilities (with a grad degree in physics).
- Having participating in a conference at CUA in the United States 2016, I was fascinated to see a panel comprised of seminarians who ALL had higher degrees in the natural sciences. It would be very valuable to know if this is a statistical trend or a fluke. If a trend, then we must find a way to welcome and encourage them to bring

their expertise into the seminary environment. I did not find this support when I was a seminarian.

- In their formation, seminarians must be given more basic natural experiences of human living and the world, freed more from the artificial, technical experience of modern human life, to know and rest in what is most fundamental and essential to human life and separate out what is accidental by such an act technology may be used and developed properly.
- Special emphasis should be given to the works of Polkinghorn, Teilhard de Chardin, and John Haught.
- The curriculum is crowded. A new course is not the answer. Incorporation of topics into existing courses seems better. Faculty in services would help.
- The possibility of philosophy serving as a "bridge" between science and faith/religion.
- This is a valuable topic that we obviously need to reflect upon further. Unless seminary curriculums address the epistemology and methodology of the dialogue between science and faith, we risk losing the young who are steeped in STEM courses in school or developing congregations that are reactionary to the scientific view and its integration into the faith.
- We are in our first year offering two courses (one in our theologate and one within our college seminary). We have had a great reception with these courses by faculty and students. The college course brought in two outside speakers for public lectures that drew over 300 people. The theologate has a neuroscientist teach several classes via video-conferencing with the class. Both classes seem to be very positive.
- We are preparing to launch (in the fall of 2018) a seminar exploring issues of faith and reason, and science and religion I see it as an important lacuna in our curriculum, and for that matter in the PPF in general. I would teach it (my undergraduate studies were in mathematics and physics) along with another seminary faculty member who holds a doctorate in computer science.
- We have had one theology faculty member and one college faculty member receive grants from the John Carrol Science in Seminaries program to develop new courses. We have had a faculty discussion of Laudato Si. As a result, I believe we will see more attention to scientific topics in the future.

College Seminaries

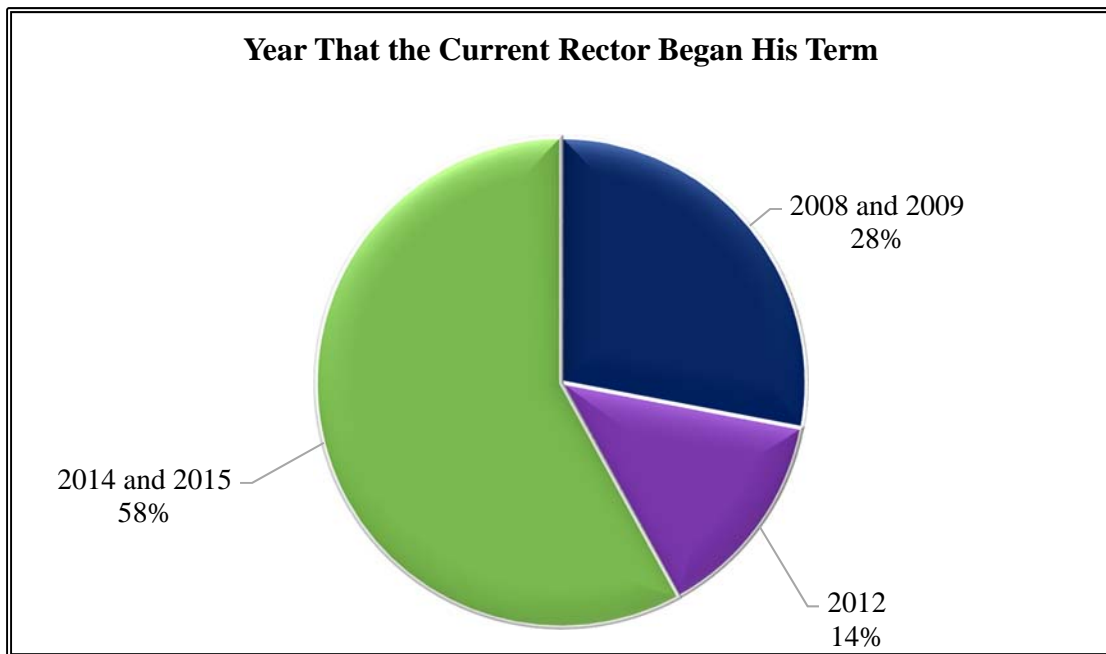
- For seminaries connected to a major university, like us, there are opportunities for science electives. Some science issues covered in formation program / speakers for entire community.

- It's a good idea to have some way to relate science and religion in the seminary, but there are also many other issues to deal with. Where do we find the time?
- No.
- Old College is a collaborative seminary with the University of Notre Dame and Holy Cross Colleges. Both of these institutions have significant core requirements in the area of the natural sciences and it vastly improves our seminarians' education. Not only does it make them more well-rounded, it also allows them to be conversant in society in general and helps them engage with those skeptics who use science to shield themselves from faith.
- Our seminary is collaborative and the seminarians all are enrolled in Gonzaga University. It is there that they receive classes and workshops on science. We offer workshops and colloquia on how to integrate what is taught in the secular world (and larger campus) into a Catholic worldview to learn what is taught, judge it in the light of reason of the Gospel, retain what is true, and integrate it into a life of virtue.
- The possibility of philosophy serving as a "bridge" between science and faith.
- We have received a Templeton Grant to support training and research. Since most seminaries have theologians or philosophers, it is helpful to be able to have funds to develop new courses that can connect with Catholic scientists.

Part II: Responding Institutions outside the United States

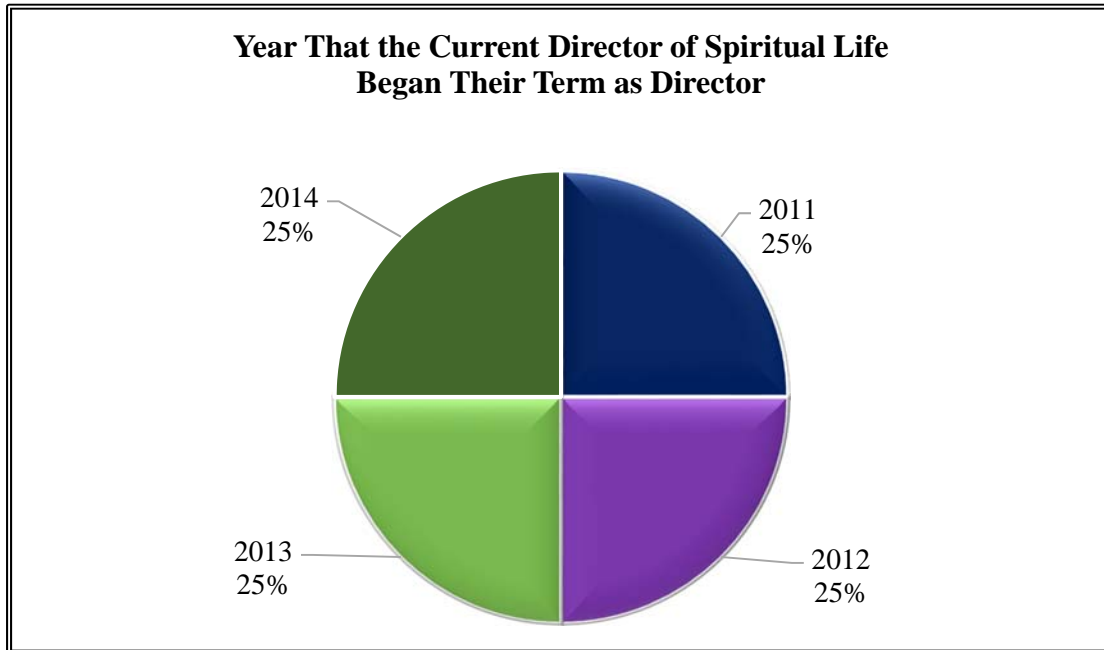
Out of 34 surveys sent to Australia (12), Canada (11), South Africa (5), Great Britain (4), and Ireland (2), seven surveys were completed and returned: two from Australia, two from Canada, two from South Africa, and one from Ireland. Due to limited data from these countries, this report provides a brief summary of the responses from the responding rectors.

Responding rectors report becoming a rector in 2008 and 2009 (28 percent), 2012 (14 percent) and 2014 and 2015 (58 percent).



The longest serving rector is eight years in this position while the shortest serving rector is one year or less as a rector.

On average, directors of spiritual life have served in their role for four years.



- Rectors report that the current director of spiritual life in their seminary began their term as director in 2011 or earlier (25 percent), 2012 (25 percent), 2013 (25 percent), and 2014 (25 percent).
- Seminary rectors report that their seminary has an average of two spiritual directors who are residential and three who are adjunct. Half of the seminaries have one or more residential spiritual director and half have two or more adjunct spiritual directors.
- Rectors report that their seminary has an average of seven full time clergy faculty and six full-time lay faculty. Half of the responding seminaries have two or more full-time clergy faculty and half have six or more full-time lay faculty.
- Responding rectors communicate that their seminary has an average of one clergy and one lay faculty with a background in science. They report that half of the seminaries have at least one clergy faculty with a background in science and half have less than one lay faculty with the same.
- Nearly nine in ten (88 percent) respondents report that none of their faculty members currently research or write on the intersection of science and religion.
- Respondents report that their seminary has an average of 43 seminarians enrolled. Half of the seminaries have 13 seminarians or more.

Just over six in ten respondents report that their seminary includes ontology (63 percent) and epistemology (63 percent) in their seminary curriculum. Half report including cosmology (50 percent) and applied ethics (other than bioethics (50 percent).

<i>Which of the following is included in your program?</i>	
Percentage responding “Yes”	
	Overall
Ontology	63%
Epistemology	63
Cosmology	50
Applied ethics in science (other than bioethics)	50
Historical theology	25
Bioethics	25
Social sciences	0
Natural sciences	0

- A quarter report that historical theology and bioethics are included in their program. None report including social sciences and natural sciences in their program.
- Just over six in ten (63 percent) say they have not included Pope Francis’ encyclical “Laudato Si” in their curriculum. Nearly four in ten (37 percent) say this encyclical has been included in their curriculum.
- Other courses included are: missiology, climate and development, development and ecology.
- Rectors report including the following courses which integrate science and religion in their program: philosophy of nature, philosophy of science, and theological anthropology (Creation). The course discusses evolution and issues related with it.
- Nearly nine in ten (88 percent) respondents report that in the past two years their seminary has not held a symposium that addressed the topic of science and religion.
- Nearly nine in ten (88 percent) respondents report that in the past two years their seminary has not held a workshop that addressed the topic of science and religion.
- Almost four in ten rectors (37 percent) say that in the past two years their seminary has invited a guest lecturer who explicitly addressed some aspects of the topic of science and religion.

- One rector said the guest lecturer had a background in science/scholarship/academics. Another said the guest lecturer’s background was either a religious or a church leader. Three percent say the guest lecturer was a medical doctor.
- All responding rectors report that no controversies arose from any of the symposia or workshops in the seminary relating to science and religion.
- In terms of preparing seminarians to evangelize in a scientific and technological world by engaging the bigger questions of science, responding rectors address this through the core curriculum (13 percent) and optional means (25 percent).

When asked how important seminarians’ understanding of various scientific topics for is their preparation to evangelize in a scientific and technological world, these rectors ranked the understanding of human sexuality and euthanasia of highest importance. More than seven in ten rectors ranked human sexuality as 7, meaning “very important.”

How important is seminarians’ understanding of the following topics to their preparation to evangelize in a scientific and technological world?

Among Responding Rectors

	Percent “Very Important”	Mean Rank	Median Rank
Human sexuality	71%	6.71	7
Euthanasia	43	6.14	6
Psychology of religion	43	5.86	6
Internet technologies	14	5.71	6
Scientific method	14	5.14	6
Sociology of religion	29	5.43	5
Stem cell research	14	5.00	5
Genetic engineering	14	4.29	4
Behaviorism	14	4.00	4
Darwinism	0	4.00	4
Artificial intelligence	0	3.86	4
Climate change	0	3.86	4

- Four in ten rectors rank euthanasia and psychology of religion as 7, meaning “very important.” Half of responding rectors rank each of these as 6 or 7. Similarly, half of responding rectors rank Internet technologies and scientific method as at least 6 but just 14 percent rank these as “very important.”

- Responding rectors give less importance to the other topics on the list. Half or more rank genetic engineering and behaviorism as at least “neutral” (4 or higher on a 7-point scale) but only 14 percent rank these as “very important.” Darwinism, artificial intelligence, and climate change are ranked as “neutral” or lower by half of rectors and none ranks these three as “very important” in preparing seminarians to evangelize in a scientific and technological world.

In preparing the seminarians to evangelize in a world that is shaped to a considerable extent by science and technology, rectors report the following as their biggest challenge:

- Although we teach only simple introductory modules and spend most of the time on human growth and development, spirituality and discernment, *Laudato Si* has been used with our students in an effort to introduce them to environmental issues and get them thinking about how these are linked to both social justice and spirituality. This said, we cannot claim to be teaching science and religion. Everything is new to some of our young lads and we feel we have done well if we can get them to see that evolutionary theory is not necessarily antagonistic to scripture studies.
- I suppose the greatest challenge is not having a common lexicon which would make discussion easier.
- Ignorance of science.
- Most seminarians do not have a background in science and do not understand the methodology of science. We are introducing an Introduction to Science module for 2017.
- Proper understanding of the use of media in such a way that a future priest will be reaching many people with the message of the Gospel.
- Seminarians need to be taught how to engage in the modern world. They cannot isolate themselves from science and technology nor can they be afraid of the world. We cannot live in a vacuum. The best way to evangelize is to dialogue with the modern world.

Appendix: Questionnaires with Response Frequencies



**Secretariat of Clergy, Consecrated Life and Vocations
United States Conference of Catholic Bishops**



**Survey of Seminary Theology Programs
(Pre-Theology Not Included)**

The intersection of science and religion is explored in many normative documents of the Catholic Church (including *Optatam totius*, *Gaudium et Spes*, the *Ratio fundamentalis institutionis sacerdotalis*, *Pastores dabo vobis*, *Evangelii Gaudium*, the Catechism of the Catholic Church, and, most recently, Pope Francis' *Laudato Si*). According to the Program of Priestly Formation, 5th edition (U.S. Bishops' Conference 2006), "[t]he curriculum of studies of college seminarians must include a grounding in the liberal arts and sciences, including studies in the humanities" (#182, p.67).

This survey will help us to understand the current state of seminary preparation on the intersection of science and religion. We are seeking to know how and to what extent science and religion are taught within the seminary curriculum and integrated into seminary formation in Australia, Canada, Ireland, South Africa, the United Kingdom, and the United States.

Engaging Science in Seminaries

- | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------|-------------------------------|----|-------------------------|----|-------------------------------|---|
| <p>1. Year that you began your term as rector of this seminary: Mean 2012 Median 2012
 2010 or earlier 19 NR 13
 2011 to 2014 59
 2015 to 2016 22</p> <p>2. Year that the current director of spiritual life began their term as director: Mean 2012 Median 2014
 2004 or earlier 12 NR 16
 2005 to 2009 15
 2010 to 2014 31
 2015 to 2016 42</p> <p>3. Of the total number of spiritual directors for the seminary, how many are:
 Residential: Mean 5 Median 4 NR 10
 Adjunct: Mean 7 Median 5 NR 10</p> <p>4. Total number of <u>full-time</u> faculty employed by the seminary:
 Full-time clergy: Mean 10 Median 9 NR 0
 Full-time lay: Mean 7 Median 7 NR 0</p> <p>5. Total number of faculty members with an academic background in science:
 Clergy: Mean 1 Median 1 NR 3
 Lay: Mean <1 Median 0 NR 10</p> <p>6. Total number of seminarians enrolled: NR 3
 Mean 80 Median 78</p> <p>7. Is Pope Francis' encyclical "Laudato Si" currently included in the curriculum? NR 0
 Yes 74
 No 26</p> | <p>What is the name of the course(s) that explores Laudato Si?</p> <p>8. In the past two years, has your seminary held a symposium(s) that explicitly addressed some aspect of the topic of science and religion?
 Yes 32
 No 68
 NR 0
 If yes, what was the title of the symposium(s)?</p> <p>9. In the past two years, has your seminary held a workshop that explicitly addressed some aspect of the topic of science and religion?
 Yes 23
 No 77
 NR 0
 If yes, what was the workshop's title(s)?</p> <p>10. In the past two years, has your seminary offered a guest lecturer(s) who explicitly addressed some aspect of the topic of science and religion?
 Yes 61
 No 39
 NR 0
 If yes, what is the background of the guest lecturer(s)? <i>Please select all that apply.</i></p> <table border="0" style="margin-left: 40px;"> <tr> <td></td> <td style="text-align: right;">Checked</td> </tr> <tr> <td>Scientist/scholar/academician</td> <td style="text-align: right;">55</td> </tr> <tr> <td>Religious/Church leader</td> <td style="text-align: right;">36</td> </tr> <tr> <td>Other. <i>Please specify.</i></td> <td style="text-align: right;">3</td> </tr> </table> | | Checked | Scientist/scholar/academician | 55 | Religious/Church leader | 36 | Other. <i>Please specify.</i> | 3 |
| | Checked | | | | | | | | |
| Scientist/scholar/academician | 55 | | | | | | | | |
| Religious/Church leader | 36 | | | | | | | | |
| Other. <i>Please specify.</i> | 3 | | | | | | | | |

11. Have any of the activities described in items 8, 9, or 10, above, caused disagreement or controversy at the seminary?

Yes 7

No 93

NR 13

If yes, please describe the topic(s) or issue(s) of controversy.

12. Do any faculty members currently conduct research or writing on the intersection of religion and science (e.g., in ontology, bioethics, etc.)?

Yes 77

No 23

NR 0

If yes, please describe the topic(s) or issue(s):

13. Please provide an example of a course in your program that integrates science and religion.

Course title:

14. Which of the following is incorporated into your program? *Please select all that apply.*

Checked

- 77 Ontology
- 87 Epistemology
- 84 Bioethics
- 42 Applied ethics in science (other than bioethics)
- 65 Cosmology
- 84 Historical theology
- 65 Social sciences
- 32 Natural sciences
- 7 Other. *Please specify:*

15. Through which means (if any) does your program prepare men to evangelize in a scientific and technological world by engaging the bigger questions of science? *Please select all that apply.*

Checked

- 61 Core curriculum
- 74 Optional courses
- 48 Extracurricular (e.g., invited lecturers)
- 3 Other. *Please specify:*

16. How important is seminarians' understanding of the following topics to their preparation to evangelize in a scientific and technological world? *Please rate each topic from 1 (not important) through 4 (neutral) to 7 (very important).*

Mean	Median	
5.39	5	Scientific method
5.58	6	Darwinism
4.76	5	Behaviorism
5.03	5	Sociology of religion
5.20	5.5	Psychology of religion
4.71	5	Climate change
6.13	6	Genetic engineering
4.63	5	Artificial intelligence
5.41	6	Internet technologies
6.23	6	Stem cell research
6.55	7	Euthanasia
6.68	7	Human sexuality

17. What other topics or issues on the intersection of science and religion are important to good preparation of the seminarians?

18. In your opinion, what is the biggest challenge in preparing seminarians to evangelize in a world that is shaped to a considerable extent by science and technology?

19. Do you have any other thoughts regarding the topic of science and religion in Catholic seminaries?

Seminary Name: _____

Seminary Address: _____

Name of person completing this form: _____

Email of person completing this form: _____

Thank you for participating in this survey.

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**Secretariat of Clergy, Consecrated Life and Vocations
United States Conference of Catholic Bishops**



**Survey of College Seminary Programs
(Pre-Theology Not Included)**

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Engaging Science in Seminaries

- | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------|-------------------------------|----|-------------------------|----|-------------------------------|----|
| <p>1. Year that you began your term as rector of this seminary: Mean 2013 Median 2014
 2010 or earlier 17 NR 5
 2011 to 2014 50
 2015 to 2016 33</p> <p>2. Year that the current director of spiritual life began their term as director: Mean 2013 Median 2014
 2004 or earlier 6 NR 16
 2005 to 2009 6
 2010 to 2014 50
 2015 to 2016 38</p> <p>3. Of the total number of spiritual directors for the seminary, how many are:
 Residential: Mean 2 Median 2 NR 0
 Adjunct: Mean 7 Median 6 NR 11</p> <p>4. Total number of <u>full-time</u> faculty employed by the seminary:
 Full-time clergy: Mean 4 Median 3 NR 11
 Full-time lay: Mean 4 Median 2 NR 21</p> <p>5. Total number of faculty members with an academic background in science:
 Clergy: Mean 2 Median 0 NR 11
 Lay: Mean 3 Median 1 NR 16</p> <p>6. Total number of seminarians enrolled:
 Mean 40 Median 42 NR 5</p> <p>7. Is Pope Francis' encyclical "Laudato Si" currently included in the curriculum? NR 11
 Yes 29
 No 71</p> | <p>What is the name of the course(s) that explores Laudato Si?</p> <p>8. In the past two years, has your seminary held a symposium(s) that explicitly addressed some aspect of the topic of science and religion?
 Yes 37
 No 63
 NR 0
 If yes, what was the title of the symposium(s)?</p> <p>9. In the past two years, has your seminary held a workshop that explicitly addressed some aspect of the topic of science and religion?
 Yes 16
 No 84
 NR 0
 If yes, what was the workshop's title(s)?</p> <p>10. In the past two years, has your seminary offered a guest lecturer(s) who explicitly addressed some aspect of the topic of science and religion?
 Yes 53
 No 47
 NR 0
 If yes, what is the background of the guest lecturer(s)? <i>Please select all that apply.</i></p> <table border="0" style="margin-left: 20px;"> <tr> <td></td> <td align="right">Checked</td> </tr> <tr> <td>Scientist/scholar/academician</td> <td align="right">37</td> </tr> <tr> <td>Religious/Church leader</td> <td align="right">32</td> </tr> <tr> <td>Other. <i>Please specify.</i></td> <td align="right">10</td> </tr> </table> | | Checked | Scientist/scholar/academician | 37 | Religious/Church leader | 32 | Other. <i>Please specify.</i> | 10 |
| | Checked | | | | | | | | |
| Scientist/scholar/academician | 37 | | | | | | | | |
| Religious/Church leader | 32 | | | | | | | | |
| Other. <i>Please specify.</i> | 10 | | | | | | | | |

11. Have any of the activities described in items 8, 9, or 10, above, caused disagreement or controversy at the seminary?

Yes 0

No 100

NR 21

If yes, please describe the topic(s) or issue(s) of controversy.

12. Do any faculty members currently conduct research or writing on the intersection of religion and science (e.g., in ontology, bioethics, etc.)?

Yes 44

No 56

NR 5

If yes, please describe the topic(s) or issue(s):

13. Please provide an example of a course in your program that integrates science and religion.

Course title:

14. Which of the following is incorporated into your program? *Please select all that apply.*

Checked

- 58 Ontology
- 79 Epistemology
- 47 Bioethics
- 32 Applied ethics in science (other than bioethics)
- 47 Cosmology
- 42 Historical theology
- 63 Social sciences
- 63 Natural sciences
- 32 Other. *Please specify:*

15. Through which means (if any) does your program prepare men to evangelize in a scientific and technological world by engaging the bigger questions of science? *Please select all that apply.*

Checked

- 63 Core curriculum
- 63 Optional courses
- 47 Extracurricular (e.g., invited lecturers)
- 21 Other. *Please specify:*

16. How important is seminarians' understanding of the following topics to their preparation to evangelize in a scientific and technological world? *Please rate each topic from 1 (not important) through 4 (neutral) to 7 (very important).*

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5.71	6	Scientific method
5.35	5	Darwinism
4.76	4	Behaviorism
5.00	5	Sociology of religion
5.06	5	Psychology of religion
4.94	5	Climate change
5.76	6	Genetic engineering
3.88	4	Artificial intelligence
6.18	6	Internet technologies
5.94	6	Stem cell research
6.35	7	Euthanasia
6.71	7	Human sexuality

17. What other topics or issues on the intersection of science and religion are important to good preparation of the seminarians?

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