NATIONAL ENDOWMENT FOR THE
Humanities

DIVISION OF **EDUCATION PROGRAMS**

# Narrative Section of a Successful Application

The attached document contains the grant narrative and selected portions of a previously funded grant application. It is not intended to serve as a model, but to give you a sense of how a successful application may be crafted. Every successful application is different, and each applicant is urged to prepare a proposal that reflects its unique project and aspirations. Prospective applicants should consult the Humanities Initiatives at Hispanic-Serving Institutions application guidelines at http://www.neh.gov/grants/guidelines/HI_IHHE.html for instructions. Applicants are also strongly encouraged to consult with the NEH Division of Education Programs staff well before a grant deadline.

Note: The attachment only contains the grant narrative and selected portions, not the entire funded application. In addition, certain portions may have been redacted to protect the privacy interests of an individual and/or to protect confidential commercial and financial information and/or to protect copyrighted materials.

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| Project Title: | The Convergence of Culture and Science: Expanding the Humanities Curriculum |
| Institution: | University of Puerto Rico, Mayaguez |
| Project Director: | Dana Collins |
| Grant Program: | Humanities Initiatives at Institutions with High Hispanic Enrollment |

**Project Title**: The Convergence of Culture and Science: Expanding the Humanities Curriculum at UPRM

**Institution**: The University of Puerto Rico at Mayaguez

**Project Director**: Dana L. Collins, Ph.D.

**Grant Program**: National Endowment for the Humanities: Humanities Initiatives for Faculty at Hispanic-Serving Colleges and Universities

***Project Summary:*** The University of Puerto Rico at Mayaguez (UPRM) is a Hispanic-serving University which offers undergraduate and graduate degrees in areas from the Humanities, Sciences, Agricultural Sciences, and Engineering. It is one of eleven campuses in the UPR system and the student enrollment for 2009 was 12,732, of which over 99% are Hispanic (US Department of Education, 2009). Although approximately two-thirds of registered students are in Science or Engineering Programs, all of the academic colleges require their undergraduate students to take a group of courses in the Humanities or Social Sciences as part of the general education component. However, the present curricular structure presents the disciplines as isolated areas. Students, as a result, do not come to recognize many of the connections that exist between the humanities and other disciplines. This project will address the need to enrich the core humanities offerings and curricula by taking advantage of our campus' interdisciplinary strengths and creating an interdisciplinary minor and courses. The aim is to enhance UPRM's general education by building bridges among disciplines and contextualizing novel research and current debates across the disciplines that address key recurrent humanistic questions and raise issues that inevitably calls for a reformulation of those questions in relation to today's technologically oriented world, thereby underscoring the enduring relevance of Humanistic Studies.

During the three years of the project, three interdisciplinary courses will be created which will form the backbone of a new curricular sequence in Interdisciplinary Humanistic Studies. These courses will focus on the convergences between the Humanities, Science and Technology in the areas of *Artificial Intelligence*; *Appropriate Technology: Engineering, Philosophy, and Technology Choice*; and *Theism, Cosmology, and Evolution*. By developing the courses and the curricular sequence, we will be promoting collaboration between diverse disciplines, which will lead to a systematic exploration of the areas of convergence and divergence between them. This approach is particularly relevant to us since many of our engineering and science students have demonstrated an interest in the wider ethical, political and metaphysical questions and issues raised by the subjects they study. The students in the humanities, on the other hand, need to gain a more adequate grasp of technology and science as a part of culture. By participating in the courses or the sequence, UPRM students will be able to develop their critical abilities in identifying and defending genuine forms of human progress.

An interdisciplinary team of thirteen faculty members from the Humanities, Social Sciences, Natural Sciences, Engineering, and Agricultural Sciences will participate in three series of faculty development seminars to study the problems and questions raised by explorations into Artificial Intelligence; the convergence of Engineering, Philosophy, and Technology; and the intersections that exist in Cosmology, Evolution, and the concept of God. These faculty members will read and discuss key texts and participate in faculty development seminars and follow-up teleconferences given by six recognized visiting scholars and lead UPRM faculty members in each of the areas in order to prepare and develop the proposed courses and sequence. The faculty development seminars will be open to the university community, especially the faculty of the Humanities and Social Sciences Departments. In addition, the materials created during these seminars and conferences will be available for use by the Humanities faculty in order to enrich the existing core Humanities offerings and published at the end in a text for future reference by interested professors. The expert visiting scholars will also provide support for the development of the courses and the sequence by reviewing the course pedagogies and syllabi, as well as the format of the curricular sequence.

***Intellectual Rationale*:** The growing density and depth of scientific discoveries, the inventiveness implicit in changing technologies, and the social, cultural, and environmental global changes that characterize our creative and troubled times all present challenges that call for the critical examination of core beliefs and for the consideration of new perspectives. These challenges form the basis for study of the areas of artificial intelligence, appropriate technology, and religion, cosmology, and evolution, all of which influence and shape the modern world, as well as our conceptions about our place in the world and in society. A complete study of these areas requires addressing recurrent fundamental humanistic questions or the raising of issues that inevitably lead to a reformulation of those questions.

An interdisciplinary team that includes professors from the humanities, the natural and social sciences, and engineering areas of (UPRM), together with visiting expert scholars, will participate in a three-year long series of interdisciplinary faculty development seminars that will focus on the convergences of the diverse facets of the three proposed areas of study. These seminar series will contextualize the current debates and questions that define the project and the reality of artificial intelligence; the current debates and questions that have to do with choice in technological design, technological appropriateness and technological culture, cosmology and evolution. Given the depth and complexity of these three areas, an intensive interdisciplinary approach, rather than a single discipline approach, is required for a thorough study of their diverse elements. Such an approach is supported by Hübenthal (1994); Klein and Newell (1997); Loepp (1999); Lacutta (2001); Newell (2001); and Minnis and John-Steiner (2006). Klein and Newell (1997) state that an interdisciplinary approach provides a process for considering questions, problems, or topics that are too broad to be dealt with by a single discipline or profession. (pp. 393-394). This perspective is reiterated in many scholarly journals dedicated to interdisciplinary studies.

The series of faculty development seminars will culminate in the creation of three interdisciplinary courses and a new Interdisciplinary Humanities Curricular Sequence. By studying these areas and creating these courses, this initiative will strengthen and broaden UPRM's humanities offerings by emphasizing the essential links that exist between the humanities and the scientific and technological areas. These areas are especially prominent in our campus; the proposed courses and sequence will counteract the misconception that the humanities and science or technology are entirely separate entities. The goal of these courses will be to study the recurrent fundamental humanistic questions that help shape our response to and use of science and technology in today's world. As Maria Bustillos remarks our material environment is transformed by machinery and technology, which forms "our view of reality, our structures of meaning, our sense of identity" (Bustillos, 2011). Technology today is an integral and formative part of our culture. Technology is not ethically, politically, or metaphysically neutral. These proposed seminars, courses, and curricular sequence will investigate and examine these convergences and divergences between the humanities, the sciences, and engineering in the contemporary world. We envision that the creation of the new courses and sequence, by expanding the critical appreciation of the relationships, will provide the stimulus necessary for renovating UPRM's Humanities offerings. The journey begins wit the faculty development seminars led by UPRM professors and expert scholars with the desired interdisciplinary orientation.

***Audience***: URPM Humanities and interdisciplinary professors from other the social and natural sciences and engineering will meet to discuss and study the interwoven facets of the three target areas in a series of faculty development seminars. This intensive interdisciplinary study of the cultural and technological implications of each area will strengthen the teaching capabilities and experiences of the humanities faculty through an intellectual and scholarly interchange between the

disciplines (Armstrong, N.P.).

Currently, all students are required to complete a humanities component as part of their general education requirements (University of Puerto Rico, 2010). Our experience indicates that the engineering and science students have demonstrated an interest in the wider ethical, political and metaphysical questions and issues raised by the subjects they study. The students in the humanities, on the other hand, need to gain a more adequate grasp of technology and science as a part of culture. By participating in the courses or the sequence, UPRM students will be able to develop their critical abilities in identifying and defending genuine forms of human progress. By creating the proposed courses and sequence, we will be offering to our students a more integrated and interdisciplinary learning experience that will help them consider all of the effects of technology.

***Content and Design****:* Thirteen faculty members from across the disciplines will attend a series of faculty development seminars to study the convergence of problems and questions in the areas of artificial intelligence, appropriate technology, and religion, cosmology, and evolution. These studies will promote collaboration between diverse disciplines, with the expectation that this will lead to a systematic exploration of the interplay between the humanities, science, and technology, as well as creating the means for a more profound and integrated humanities learning experience for all of our students.

The faculty development seminars will broaden the knowledge base of the participating professors and simultaneously serve to develop the new interdisciplinary courses and an curricular sequence. Lead project members and members of the university faculty will read and discuss key texts and participate in seminars given by recognized expert scholars and lead faculty members in three proposed areas. The visiting scholars will provide support for the development of the courses and the curricular sequence by providing followup teleconferences, and by reviewing the course

bibliographies, syllabi, pedagogies, and format of the curricular sequence. The seminars will be open to the university community, and especially the humanities professors, in order to create opportunities to improve and expand the teaching of the humanities. By their very natures, it is intended in these courses that the students be immersed in the interdisciplinary nature of the three target areas. The sequence and the courses will combine fundamental research in the humanities with active, hands-on learning in order to teach the concepts of research in the humanities and the sciences as they relate to the three courses.

Dr. Carolyn Haynes, an interdisciplinary consultant with the Association for Integrative Studies, will serve as the expert advisor on creating, reviewing, and assessing interdisciplinary courses and programs. She has extensive experience in consulting, reviewing, and accrediting interdisciplinary programs (Association for Integrative Studies, 2008). In addition to opening the faculty development seminar series, she will offer followup teleconferences during the second and third years of the project. These seminars will use as a base her book, *Innovations in Interdisciplinary Teaching*. Additional readings by Klein and Newell (1997); Loepp (1999); Lacutta (2001); Newell (2001) will be studied in the seminars dedicated to interdisciplinary theory.

In the area of *Artificial Intelligence*, Dr. Fernando Vega, Dr. Ana Nieves-Rosa, and Dr. Anderson Brown from the engineering, psychology, and humanities, respectively, will focus on the social, philosophical, psychological, and technical aspects of the creation and use of artificial intelligence. Pamela McCorduck's book *Machines Who Think* will form the base for the discussion and examination. Other readings that also explore the philosophical, psychological, and technical aspects are Crane's *The Mechanical Mind: A philosophical introduction to minds, machines and mental representation;* Franzén's *Gödel's Theorem: An Incomplete Guide to Its Use and Abuse*; Noam Chomsky's *Aspects of a Theory of Syntax*; Alan Turing's “Computing Machinery and

Intelligence," and Saul Kripke's "*Identity and Necessity*".

In the area of *Appropriate Technology: Philosophy, Engineering, and Technology Choice*, Drs. Carl Mitcham and Indira Nair, both interdisciplinary experts in appropriate technology, will focus on the philosophical and social aspects of engineering design and technological innovation and present a critical analysis of the idea of "progress". Dr. Carl Mitcham is a professor of philosophy

with a specialties in philosophy and ethics of science, technology, and engineering. He is a noted as interdisciplinary scholar who has integrated the philosophy of technology into the interdisciplinary area of Science, Technology, and Society Studies (Colorado School of Mines, 2011). He is the Director of the Hennebach Program for the Humanities and is known for his research in such areas as the theory of interdisciplinary studies and engineering ethics. He received the international World Technology Network award for Ethics in 2006. Dr. Indira Nair is the Vice Provost of Education and Professor of Engineering and Public Policy at Carnegie Mellon University where her main areas of study are in the areas of interest are environmental science, policy, individual decision making, and ethics. In subsequent faculty development seminars the political, economic, cultural, ethical, and environmental appropriateness of current trends in engineering design and technological innovation will be studied. In order to study the many facets and ramifications of appropriate technology in today's world, the readings of the seminars will focus on such works as Carl Mitcham's *Thinking Through Technology: The Path Between Engineering and Philosophy* and Indira Nair's and C.J. Atman's article "Do Engineers and Humanities Majors Perceive STS Issues Differently?. Additional readings will include works from Scharff and Dusek's anthology, *Philosophy of Technology: The Technological Condition;* Schumacher's *Small Is Beautiful*: *Economics As If People Mattered*; and O'Neill-Carrillo's Anthology- *Antología de*

*Lecturas del Instituto Tropical de Energía.*

The area of Theism, Cosmology, and Evolution, including the history of these notions, their philosophical development, and the scientific theories developed to understand the origins and evolution of life on Earth and the space-time structure of universe, will be examined in the third year of the project. The seminars will contrast the humanist and scientific viewpoints, highlighting coincidence and divergence. Dr. Jorge Ferrer-Negrón, Dr. Enectalí Figueroa-Feliciano, and Dr. Donald Pfister, and Dr. Alan Guth will present seminar on the areas of Philosophy of Religion, Cosmology, and Evolution. Dr. Ferrer-Negrón is a philosophy professor from the UPRM and holds degrees in philosophy and theology. He is noted as an international expert in the areas of bio- and medical ethics. He has taught classes in ethics and philosophy of religion. Dr. Enectalí Figueroa-Feliciano is a physics professor in the Department of Physics at the Massachusetts Institute of Technology. His group is active in an interdisciplinary study which seeks to gain insights into the nature of our universe (MIT, 2011). Dr. Donald Pfister, a specialist in the Biology Department of Harvard University, is the Asa Gray Professor of Systematic Botany, the Curator of the Farlow Library and Herbarium, and the Dean of the Harvard Summer School. Dr. Alan Guth is a renowned astrophysicist from the Massachusetts Institute of Technology. He is best known for his theory of "inflationary universe", a modification of the Big Bang Theory. The scholars involved in these seminars will focus on such readings as *The Natural History of Religion* by Hume, Wright's *The Evolution of God*; Mackie's *The Miracle of Theism: Arguments For and Against the Existence of God*; Gould's *The Richness of Life: The essential Stephen J. Gould*; Steinhardt and Turok's *Endless Universe: Beyond the Big Bang*; and Darwin's *The Origin of the Species*.

During the course of the three-year project, participating professors will be required to design, present, and discuss their syllabi for the target courses with the visiting scholars. By the end

of the third year, these courses, together with the existing foundation courses Introduction to Western Culture I and II, will form the core for the proposed Interdisciplinary Humanities Curricular Sequence. All planned readings for each faculty Development Seminar can be found in Appendix A.

*Institutional Context*: The University of Puerto Rico, Mayagüez (founded in 1911), is one of the leading institutions of higher education in Puerto Rico, with most of its faculty holding doctoral degrees in their respective disciplines. UPRM is a Hispanic-serving land-grant institution that offers undergraduate and graduate degrees in disciplines in the Humanities and the Arts, Natural Sciences, Engineering, and Business Administration. According to the IPEDS data of the Department of Education, the undergraduate student enrollment for 2009 was 12,732, of which over 99% were Hispanic. Although more than half of registered students at UPRM are in Science or Engineering Programs, all of the academic colleges require their undergraduate students to take a group of courses in the Humanities or Social Sciences as part of the general education component.

The basic humanities requirement of the UPRM general education component was established in the 1970's and consists of a two-semester Western Culture survey course, which is required by the College of Arts and Sciences. The remaining three Colleges (Engineering, Agricultural Sciences, and Business Administration) require their students instead to take a number of credits within the Humanities or Social Sciences offerings, but selection is mainly left to the students and their academic advisors. With this project, we hope to begin a renovation of the humanities general education requirements by expanding and enhancing the available humanities offerings and demonstrating the connections between that the humanities, science, and technology and only when considered together present a coherent panorama of today's world. The interdisciplinary context of this project responds to our students academic needs, and the

University's mission and expected Student Outcomes, by developing students' critical thinking and reasoning skills, their ability to effectively communicate their ideas, apply ethical standards, work in a global context, and demonstrate respect and appreciation for other cultures, the arts, and the humanities.

This project is supported by the Chairpersons of the Departments of Humanities, Electrical and Computer Engineering, Engineering and Materials Science, as well as the Deans of Academic Affairs, Arts and Sciences, and Engineering (Appendix B). In addition, the Colleges of Arts and Sciences and Engineering have granted release time to four lead professors who will participate in the project. The faculty resources for this project are truly interdisciplinary in their abilities. The project director is Dana L. Collins, Associate Professor of Humanities and Director of the Center for Resources in General Education (CIVIS). She has served twice as the Director of the Department of Humanities and is very familiar with the strengths and weaknesses of UPRM's core humanities offerings. Dr. Collins has worked in the areas of Interdisciplinary Writing in the Disciplines in interdisciplinary initiatives dedicated to improving our students' communication skills for the past seven years. Her curriculum vita is included in Appendix C.

The expert advisors, all of whom have agreed to participate if the project is funded, will be Dr. Jorge Ferrer-Negrón (UPRM), Dr. Enectalí Figueroa-Feliciano (MIT), Dr. Carolyn Haynes (University of Miami, Ohio), Dr. Carl Mitcham (Colorado School of Mines), and Dr. Indira Nair (Carnegie Mellon Institute). Their Curriculum Vitae, letters of commitment, and brief biographies are included in Appendix C.

The lead professors for the project come from a wide spectrum of the disciplines. They include: Dr. Dana L. Collins, Associate Professor of Humanities and Director of the Center for Research in General Education; Dr. Héctor Huyke, Professor of Philosophy; Dr. Anderson

Brown, Associate Professor of Philosophy; Dr. Ana Nieves-Rosa, Associate Professor of Psychology; Dr. Nayda Santiago, Associate Professor of Electrical Engineering; Dr. Christopher Papadopoulos, Assistant Professor of Engineering; Dr. Marcel Castro, Assistant Professor of Engineering; Dr. Fernando Vega, Professor of Engineering; Dr. Matías Cafaro, Associate Professor of Biology; Dr. Héctor Jiménez, Professor of Physics; Dr. Raúl Portuondo-Duany, Professor of Physics; Dr. Brian Muñoz, Assistant Professor of Humanities; and Dr. Lucas Avilés, Professor of Agricultural Sciences. Their curriculum vita are included in Appendix C.

***Evaluation***: The primary evaluation of the project will consist of: 1) the assessment of the faculty development seminars and the created materials, and 2) an analysis of the data and results of evaluations of the implemented courses. In order to assess the success of the seminars, we will evaluate faculty perceptions on their effectiveness for facilitating interdisciplinary course development, research, and teaching. This assessment tool will be available online as well in hard-copy to accommodate those professors who will utilize the material presented online. Secondary assessment will take place in the classrooms during the pilot offerings of the courses. We will assess, via the use of pre- and post-tests, the impact of the interdisciplinary method on the students attainment of UPRM's Student Outcomes. We will also evaluate the effectiveness of each course at the end of the first offering of the course. This evaluation will contain both quantitative and qualitative questions in order to formulate a more complete picture of the effectiveness of project effectiveness and to facilitate the creation of future interdisciplinary courses.

***Follow-up and Dissemination***: The experience obtained from this project will further the creation of other interdisciplinary humanities courses in the future, which could then be integrated into the proposed Interdisciplinary Humanities Curricular Sequence, thus expanding its scope and content. By the end of the project, the proposed courses will be submitted for approval as permanent courses

and the curricular sequence will be submitted to the Department of Humanities for approval. Projected additional activities include the following: lead professors involved in the project will serve as mentors for faculty members interested in creating additional interdisciplinary courses; the presentation of the results and data in a final colloquium at the end of the project that will be open to the university community; the outcomes of the project will be published or presented in local and national venues; and the course materials will be published in a central site on the University Moodle page for easy access by other interested university faculty. In addition, a text will be written that will present the processes that were followed and implemented in creating the course materials, the courses, and the curricular sequence.

The Bibliography for the Project Narrative can be found in Appendix E.

**Appendix A: Work Plan, Readings, and Schedule of Activities**

**Year 1: Introduction to Interdisciplinary studies and Artificial Intelligence**

***Faculty Development Seminar 1****: Theory/Implementation of Interdisciplinary Courses and Programs:* Visiting Scholar Dr. Carolyn Haynes of the Association for Intergrative Studies, will open the project seminar series with a day-long seminar that examines the theories, development, implementation, and assessment of interdisciplinary courses and programs. Faculty participants will discuss the means for creating and implementing interdisciplinary programs, as well as preparation of the course syllabus. Readings:

- Haynes, Carolyn. (2002). *Innovations in Interdisciplinary Teaching*. Rowman & Littlefield Publishers, Inc.
- Newell, W.H. (2001). "A Theory of Interdisciplinary Studies". Issues in Integrative Studies, 10, 1-25.

***Faculty Development Seminar 2*****:** *Mental representation: The Cartesian tradition and contemporary alternatives*. Dr. Anderson Brown and the participating faculty members will focus on an examination of the mind/body dualism as derived form Descartes and contemporary philosophers. Readings:

- Crane, T. (2003). *The Mechanical Mind: A philosophical introduction to minds, machines and mental representation.* London: Routledge.
- Christos, G. (2003). *Memory and Dreams: The Creative Human Mind*. University of New South Wales Press.
- Descartes, R. (2007). *Discourse on Method and Meditations on First Philosophy*. BN Publishing.

interdisciplinary topic: "How robotics is changing perceptions of cognitive science". Participants will consider how the elements of perception, language, and reasoning information are processed, represented, and transformed in humans and machines. Readings:

- Chomsky, N. (1969). *Aspects of a Theory of Syntax.* Ann Arbor, MI: The MI.
- Gould, S.J. (1996). *The Mismeasure of Man.* New York*:* W. W. Norton & Company.
- Kripke, S. (1980). "*Identity and Necessity," Naming, Necessity and Natural Kinds*. Cambridge: Harvard University Press.

**Year 2: Appropriate Technology: Engineering, Philosophy, and Technology Choice**

***Faculty Development Seminar 1****: Implementation of Interdisciplinary Courses and Programs II*: To open the second year of the project seminar series, faculty participants and professors will participate in a teleconference seminar with Dr. Carolyn Haynes in order to assess the course on Artificial Intelligence offered during the previous semester and to revisit the theory and implementation of interdisciplinary studies (with course syllabus preparation) with the objective of strengthening the humanities curriculum at UPRM. Readings:

- Selections from Levin, L. and I. Lind, eds. (1985). *Interdisciplinarity revisited: Re-assessing the concept in the light of institutional experience.* Stockholm: Organization for Economic Cooperation and Development, Swedish Board of Universities and Colleges.
- Loepp, F.L. (1999). "Models of Curriculum Integration". Journal of Technology Studies. XXV: 2) Retrieved 14 June 2011 from http://scholar.lib.vt.edu/ejournals/JOTS/ Summer-Fall-1999/Loepp.html.
- Minnis, M. and John-Steiner, V.P. (2006). *"Interdisciplinary Integration in Professional*

*Education: Tools and Analysis from Cultural Historical Activity Theory"*. Issues in Integrative Studies, 24, 32-88.

***Faculty Development Seminar 2*** *with Visiting Professor Carl Mitcham*: This conference will focus on the philosophical aspects of the design, use and choice of technologies. Emphasis will be given to the analysis of the idea of progress, the concept of humanitarian engineering and how different conceptions of human progress relate to differences in design and innovation in technology.

Readings:

- Castro, M., C. Papadopoulos, and H. Huyke. (2011) "Creating Interdisciplinary Forums in the Philosophy of Technology" in P. Vermaas, D. Goldberg, E. Selinger, and I. van de Poel Ibo (eds.). *Philosophy of Engineering and Technology.* Springer (to appear).
- Mitcham, C. (1994). *Thinking Through Technology: The Path Between Enginering and Philosophy*. Chicago: The University of Chicago Press.
- Mitcham, C. and Munoz, D. (2010). *Humanitarian Engineering: Synthesis Lectures on Engineers, Technology and Society*. San Rafael, CA: Morgan & Claypool Publications.

***Faculty Development Seminar 3*** *with Visiting Professor Indira Nair*: This conference will have an emphasis on the concept of appropriate technology from the practitioner's perspective. Professor Nair will focus on the critique of current trends in engineering design and technological innovation in different contexts. Special attention will be given to alternatives to current trends and to questions of policy from the perspective of community development and social justice. Readings:

- Riley, D. (2008). *Engineering and Social Justice*, Morgan and Claypool.
- Nair, I. and C.J. Atman. (1994). "Do Engineers and Humanities Majors Perceive STS Issues Differently?". *Proceedings of the American Society for Engineering Education Conference*, pp. 225-229.
- Selections from: Efraín O'Neill-Carrillo (Ed.), *Antología de Lecturas del Instituto de Tropical Energía, Ambiente y Sociedad*, 2009. "Sustainable Energy: Balancing the Economic, Environmental and Social Dimensions of Energy", "Advancing a Sustainable Energy Ethics Through Stakeholder Engagement".
- Schumacher, E.F. (2000). *Small Is Beautiful: Economics As If People Mattered: 25 Years Later*. London: Hartley and Marks Publishers.


***Faculty Development Seminar 4*: *Interdisciplinarity and Appropriate Technology***. A draft of the course syllabus on Appropriate Technology: Philosophy, Engineering and Technology Choice will be discussed with faculty participants and professors in order to get feedback. Emphasis shall be on the course's interdisciplinary nature, its assessment plan, and its potential contribution to strengthening the humanities curriculum at UPRM. This seminar will be led by Dr. Héctor J. Huyke, Professor of Philosophy from the Department of Humanities, Dr. Marcel Castro-Sitiriche, from the Department of Electrical and Computer Engineering, and Dr. Christopher Papadopoulos, Professor of Mechanics from the Department of Engineering Science and Materials.

***Faculty Development Seminar 5:*** *Follow-up teleconference:* This seminar will consist of a teleconference with Professors Mitcham and Nair midway through the semester in which the course

on Appropriate Technology: Philosophy, Engineering and Technology Choice is being offered. The objective here is to evaluate the course in progress with the scholars that visited the previous semester and with participating faculty participants and professors. This seminar will be led by Dr. Christopher Papadopoulos, Professor of Mechanics from the Department of Engineering Science and Materials, Dr. Héctor J. Huyke, Professor of Philosophy from the Department of Humanities, and Dr. Marcel Castro-Sitiriche, from the Department of Electrical and Computer Engineering.

**Year 3: God, Cosmology, and Evolution**

***Faculty Development Seminar I****: Implementation of Interdisciplinary Courses and Programs III*: This seminar will explore the implementations of the interdisciplinary courses offered in the first two years of the project. Additional theories of development, implementation, and assessment of interdisciplinary courses and programs will be examined in light of the first and second years' experiences. Also to be discussed: refinement of the course syllabus. This seminar will be led by Dr. Carolyn Haynes from the Association for Integrative Studies.

- Haynes, C., (ed). (2002). *Innovations in Interdisciplinary Teaching*. Westport; CT: Oryx/Greellwood Press.
- Minnis, M. and John-Steiner, V.P. (2006). *"Interdisciplinary Integration in Professional Education: Tools and Analysis from Cultural Historical Activity Theory"*. Issues in Integrative Studies, 24, 32-88.

***Faculty Development Seminar 2****: A history of theism.* Invited scholar Dr. Jorge Ferrer-Negrón will lead the discussion on the philosophy of religion. Questions to be considered and discussed are "Is

there a God?", "If he exists, then what is he like?" "What does that mean for humans?". Readings:

- Hume, D. (2011). The Natural History of Religion. CreateSpace.
- Wright, R. (2010). *The Evolution of God.* Back Bay Books.
- Pals, D.L. (2006). Eight Theories of Religion, OUP, USA.
- Mackie, J.L. (1983). *The Miracle of Theism: Arguments For and Against the Existence of God*. Oxford University Press, USA.

***Faculty Development Seminar 3****: Cosmology and the origin of the universe.* The visiting scholar Dr. Enectalí Figueroa-Feliciano will lead the discussion on the origin of the universe. Discussions and readings will consider and compare the Big Bang and String theories. The nature of the scientific method, as described by Chaisson, will be discussed in relation to research into the origins of the universe and in more general contexts. Readings:

- Ward, P.D., Brownlee, D. (2003). *Rare Earth (Why Complex Life is Uncommon in the Universe)*. New York: Springer.
- Chaisson, E.J. (2007). *Epic of Evolution: Seven Ages of the Cosmos*. New York: Columbia University Press.
- Steinhardt, P..J., Turok, N., (2007). Endless Universe: Beyond the Big Bang, 2007. New York: DoubleDay.

***Faculty Development Seminar 4*****:** *Darwin's 'On the origin of the species'.* The visiting scholar Dr. Donald Pfister will direct a seminar dedicated to studying Darwin's On the origin of the species and its impact in the world. Readings:

- Darwin, C. (2003). *The origin of the species: 150th Anniversary Edition*. J. Huxley (Introduction). New York: Signet Classics.
- Richards, R.J. and M. Ruse (eds.). (2008). *The Cambridge Companion to the 'Origin of Species'*. Cambridge Companions to Philosophy. Cambridge University Press.


***Faculty Development Seminar* 5:** This seminar will consist of a teleconference with the visiting scholars midway through the semester in which the course on God, Cosmology, and Evolution is being offered. The objective here is to evaluate the course in progress with the scholars that visited the previous semester and with participating faculty participants and professors. This seminar will be led by Dr. Héctor Jiménez of the Physics Department, Dr. Matías Cafaro of the Biology Department, and Dr. Raúl Portuondo-Duany of the Physics Department.

***Final Colloquium***: At the end of the third year of the project, the participating professors will present their results on the examinations of the literature, how they were able to integrate the literature into their courses, and the effectiveness of the interdisciplinary approach in a final colloquium that will be open to the public. This colloquium will serve to be a stepping stone for the creation of additional interdisciplinary courses from across the disciplnes.

**Schedule of Activities**

| Faculty development seminar series I: Introduction to interdisciplinary studies; Artificial intelligence | | | |
|---|---|---|---|
| Year | Sem. | Seminar | Faculty development seminar |
| 2012 | Feb | 1 | *Theory/Implementation of interdisciplinary courses and programs:* |
| | March | 2 | *Mental representation: The Cartesian tradition and contemporary alternatives* |
| | April | 3 | *Can consciousness emerge from Turing Machines?* |
| | Sept. | 4 | *Considerations about human and artificial intelligence from Psychology* |
| | Oct. | 5 | *Embodied cognitive science: the impact of robotics.* |
| Faculty development seminar series II: Appropriate technology: engineering, philosophy, and technology choice | | | |
| 2013 | Feb. | 1 | *Implementation of interdisciplinary courses and programs II* |
| | March | 2 | *Faculty development seminar 2 with visiting professor Carl Mitcham* |
| | April | 3 | *Faculty development seminar 3 with visiting professor Indira Nair* |
| | Aug | 4 | *Interdisciplinarity and appropriate technology* |
| | Oct | 5 | *Follow-up teleconference with visiting scholars* |
| Faculty development seminar series III: God, cosmology, and evolution | | | |
| 2014 | Feb | 1 | *Implementation of interdisciplinary courses and programs III* |
| | March | 2 | *A history of theism* |
| | April | 3 | *Cosmology and the origin of the universe with visiting scholar Enectalí Figueroa-Feliciano* |
| | Sept | 4 | *Darwin's 'On the origin of the species' with visiting scholar Donald Pfister* |
| | Oct | 5 | *Follow-up teleconference with visiting scholars* |
| | August | | *Final Colloquium and presentation of project results* |