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Cover Page Footnote

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Restorative Recreation: A Medical Humanities Course Relating Nature Prescription, Avocation, and Creation Care to Human and Ecosystem Health

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Abstract

Although there is increasing awareness of the relationships between ecosystem health, access to and interaction with nature, and human wellness, examples of instructional activities to convey these issues in medical education are limited. To address this need, a five-week elective course was developed for up to twelve students within a medical humanities curriculum. Students discuss themes covered in multi-media assignments, hike at a regional nature center, and write a final reflection essay. Discussion topics include nature-deficit disorder, nature immersion, nature prescription, creation care, social determinants of nature access and environmental health, and restorative recreation as an avocation. Follow-up surveys containing 4-point Likert questions and open-ended queries to determine student perceptions of the course were conducted for the course over two academic years. Analysis of survey responses show students felt the course met learning objectives and offered a positive and constructive learning environment. Thematic analyses identified the nature hike as a course highlight, and course content, opportunities for reflection, and discussion of how nature relates to human health as notable strengths. The course design should be viewed as adaptive to local ecosystems, environmental concerns, and ethical foundations to improve relevance to students at a given institution.

Introduction

The movement to infuse arts and humanities into medical education has been of ongoing interest for many years as a means to help improve physician well-being and empathy.¹ This movement must now also contend with a growing call to incorporate into the curriculum discussions of how climate change and environmental degradation are impacting human health.² Overlaying the medical humanities curriculum with a sense of institutional mission and identity represents an additional challenge given limited student contact time. Finally, while there is growing recognition of the links between ecosystem health, access to and interaction with nature, and human wellness, there is a gap in the

published literature regarding approaches to present these issues in medical education.³

In MedEdPORTAL, for example, searches on the terms “nature immersion,” “nature contact,” “nature prescription,” or “outdoors” returned no articles relevant to instruction on presenting the health benefits of outdoor experiences in nature as of May 17, 2022. Using the broader search term “environmental health” returned 573 articles, most of which identified only one of the two terms and contained unrelated content, with a limited subset identifying environmental conditions as a source of health disparities.⁴ Similar searches of PubMed that additionally had “medical education” as a search term returned many more articles, which included topical

categories such as (1) the need to improve environmental health as a medical school topic area; (2) environmental health risks to human disease and health disparities; and (3) the use of outdoor learning spaces in health education.⁵ However, no examples presented a systematic approach within a medical curriculum to introduce concepts related to nature and human wellness, the ethics of environmental stewardship, and intersectional ways to promote human and ecosystem health.

Creighton University in Omaha, Nebraska was founded in 1878 in the Jesuit, Catholic faith tradition. The School of Medicine (SOM) was established in 1892. The Medical School curriculum underwent revision in 2019 to introduce “Gold Selectives” to incorporate education in the medical humanities. Among the Gold Selectives, students must complete one “Student Interest Selective” (SIS) course. SIS courses have been developed through an open call for proposals to university faculty, and subjected to evaluation and approval by the SOM Curriculum Committee. This paper describes a five-week discussion-based and experiential medical humanities SIS course available to first and second year medical students (M1 and M2 students, respectively) entitled “Restorative Recreation: Caring for Yourself While Caring for Our Common Home” taught by the lead author, Dr. Patrick Swanson (PCS). The course introduces students to the concept of “nature-deficit disorder” and its impacts on human health, and discusses meaningful ways they can incorporate “nature immersion” into their lives and the lives of their patients to improve health and well-being. The course contextualizes these ideas with Sir William Osler’s advice to develop a productive avocation (i.e. leisure activities) to sustain professional engagement, and Pope Francis’ exhortation to undergo an “Ecological Conversion” to help sustain planetary health.⁶ The course also seeks to align with Creighton University’s mission to manifest *cura personalis* (care for the whole person) with its intent to encourage students to consider the intellectual and emotional value of pursuits outside their vocation and how engagement with nature can foster care for the mind, body, and spirit. Students will also reflect on the four Universal Apostolic Preferences (UAP) of the Society of Jesus, 2019-2029, particularly by emphasizing how ecological restoration can offer a hope-filled future for young people (UAP #3),

and through that exercise, directly contribute to the care of our common home (UAP #4).⁷

Educational Objectives

By the end of this course, learners will be able to:

1. Identify the origin of the term “nature-deficit disorder,” discriminating it from a medical diagnosis, and understand its meaning, causes, and consequences
2. Define the benefits of nature contact to human health
3. Reflect on what an “Integral Ecology” and an “Ecological Conversion” looks like and how it relates to Care for our Common Home
4. Identify practices that are restorative to self, community, and natural ecosystems

Methods

Dr. Swanson designed and directed the course. The impetus for the course emerged from his readings of Richard Louv and Pope Francis. In Richard Louv’s 2008 book, *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder*, he coined the term “Nature-Deficit Disorder” to describe the impact of the loss of engagement with nature on human (especially pediatric) mental and physical health.⁸ In his 2015 Encyclical Letter, *Laudato Si’: On Care for Our Common Home*, Pope Francis describes the adverse effect of unsustainable human consumption on the earth’s climate and ecosystems, and social injustice associated with climate change and environmental degradation. Pope Francis encouraged greater self-reflection of our lifestyles and changing consumption patterns to better sustain planetary and human health.⁹ Also influencing course development were the reflections of PCS on nature experiences of his child and early adulthood and his ongoing efforts to restore a native prairie remnant, and how these have impacted his own health (mental, physical, and spiritual).¹⁰

The five-week course (see Appendices A and B) begins in week one with students listening to an interview of Richard Louv, where he discusses the origin and significance of nature-deficit disorder, and the impact of the increasing deprivation of nature contact on human health and well-being.¹¹ Students also read a brief essay on this topic from a pediatric nursing perspective.¹² Students are asked to reflect on and discuss their own

experiences in nature, how these experiences have influenced their development and sense of well-being, and what senses they use to interact with the environment.

Week two extends the conversations from week one by discussing an essay describing the concept of “nature immersion” and how it can benefit mental health, and reflecting on videos showcasing two different physicians who prescribe nature to promote the wellness of their pediatric patients.¹³ Both physicians have reported on their approaches and findings elsewhere.¹⁴ Social determinants of green space access documented in these videos are also considered.

Week three assigns readings from *Laudato Si'*. Selected passages discuss human impacts to the environment and climate, and their adverse effects on human health (especially the marginalized), the intrinsic rights, wisdom, and wonder of nature, and the need to undergo an Ecological Conversion to be more effective stewards of Creation. Dovetailing with *Laudato Si'*, a recent regional case involving pesticide-laden ethanol byproduct application and a hazardous waste spill following a “polar vortex” event in 2021 is used to explore links between climate change, extreme weather events and their associated consequences to human and ecosystem health.¹⁵

Week four introduces Sir William Osler’s position on the importance of an avocation in the physician’s lifestyle, and discusses a recent study testing whether the presence and type of avocation influences the rate of physician burnout and/or professional engagement.¹⁶ Week four also introduces a concept PCS termed *restorative recreation*, which blends nature immersion, recreation, avocation, and restoration of native landscapes, as a path one can take to improve individual, community, and ecosystem health. Restorative recreation is based on PCS’s own experience restoring a native prairie remnant in the Loess Hills of Iowa.¹⁷

The last week involves a field trip to the nearby Hitchcock Nature Center to introduce students to remnant Loess Hills prairie and its native flora and fauna, to directly experience intentional nature immersion and reflect on how it influences personal well-being, and to illustrate the human impacts on the site, both degradative and restorative. Historical photos are used to

document prior damaging land use and its current state of ecological restoration, which has been assisted by the application of prescribed fire and native prairie reconstruction. A hike along Badger Ridge Trail helps illustrate increased human use of the Nature Center during the COVID-19 pandemic, which caused severe erosion and eventual rerouting of part of this trail.

For the final assignment, students compose a 1500-word essay, due one week after the field trip, reflecting on what piqued their interest in nature, and how they view themselves working to integrate nature experiences into their personal and professional lives for individual and patient benefit. The essay and course were graded as pass/fail.

The evaluation instruments include surveys standardized by the Office of Medical Education for assessment of the overall course and for small group facilitators; both offer an open-ended question to comment on what students liked best about the course and what can be improved (see Appendices C and D). The primary focus of the results and discussion will be on the course evaluation survey responses and analysis of the final essays. Written responses and essays were initially analyzed by Keirien L. Taylor to identify and code recurrent themes at a semantic level, which were further refined by both authors. Thomas J. Schechter performed statistical analyses. The reliability of the survey questionnaire was determined by calculating the Cronbach alpha, which can be effectively applied to small pilot studies.¹⁸ A Kruskal-Wallis test was performed on the survey data to determine whether the distributions in the four data sets differ; f tests were subsequently conducted to check the equality of variance between survey groups.

Results

To date, PCS has taught this course twice, in early fall of 2020 and 2021. Two class sections are offered each year: one to M1 students and one to M2 students. Course enrollment is capped at 12 students. In 2020, 12 M1 and 6 M2 students enrolled; in 2021, 11 M1 and 11 M2 students enrolled. PCS chose the fall semester over the spring term to offer this course to avoid winter weather and improve wildlife viewing opportunities for the hike.

Overall, as shown in Table I, both the M1 and M2 student classes in 2020, and the M1 student class in 2021 rated the course very highly (scores ≥ 3.5 on a 4-point scale for standardized Likert survey questions). In particular, students felt the course met learning objectives (range: 3.50 ± 0.52 - 3.73 ± 0.47) and offered a positive and constructive learning environment (range: 3.45 ± 0.69 - 3.91 ± 0.30). Somewhat lower evaluation scores recorded from the M2 student class in 2021, though still favorable, are discussed further below. A Kruskal-Wallis test performed on the four sets of survey responses showed at least one set was significantly different than the others [$H(3) = 45$, $p = 8.88e-10$], with a large effect size (0.22). Further evaluation using the f test to check the equality of variance between survey group responses showed that M1 student responses were significantly different between 2020 and 2021 ($p = 0.036$), as were M1 and M2 student responses in 2021 ($p = 0.0006$). Calculations of Cronbach's alpha for each set of survey responses were consistently above 0.8, indicative of "good" survey reliability.

In analyzing the responses to open-ended questions from the course evaluations (Table 2), 30% of student comments (12/40) identified the final nature hike as what they liked best about the course, and 48% described a range of features within the category of "course content, structure, and learning environment" as what they liked best. A smaller number of responses highlighted the unique perspective and opportunity for reflection that the course offered (13%), and discussions specifically centered on the relationship between nature and wellness/medicine (15%).

Student responses regarding areas for improvement (Table 2) reveal common and divergent themes depending on the year, and deserve further explanation to describe the situational context and PCS's adjustments to the feedback. Nevertheless, more than 25% of the students stated that the course needed no improvement.

Table 1. Likert Rating^a for Selected Course Evaluation Survey Items

Question	2020 Course Year		2021 Course Year	
	M1 Class (n=12)	M2 Class (n=6)	M1 Class (n=11)	M2 Class (n=11)
The course design, organization, and sequence facilitated my learning.	3.50±0.52	3.67±0.52	3.64±0.50	2.82±0.75
In general, learning goals and objectives were met.	3.50±0.52	3.60±0.55	3.73±0.47	3.00±0.63
Course assignments contributed to my learning.	3.42±0.51	3.60±0.55	3.82±0.40	3.09±0.54
This course offered a positive and constructive learning environment (e.g. respectful and collegial).	3.45±0.69	3.83±0.41	3.91±0.30	3.18±0.60
Overall, this course offered a positive learning experience.	3.45±0.52	3.80±0.45	3.91±0.30	3.00±0.67
Cronbach's Alpha	0.858	0.891	0.885	0.954
f-test (M1 vs M2, by year) ^b	$p = 0.43$		$p = 0.0006$	
f-test (2020 vs 2021, by class) ^b	$p = 0.036$	$p = 0.063$		

^a Rated on a 4-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree).

^b Kruskal – Wallis Test on full data set: [$H(3) = 45$, $p = 8.88e-10$]; effect size = 0.220

During the first year, the COVID-19 pandemic required class sessions to be conducted remotely via Zoom, but the field trip was held with appropriate masking and social distancing. Perhaps not surprisingly, students in the 2020 class wished the sessions could have been held in person, and ideally outside (Table 2). Such remarks led PCS to hold parts of two class sessions outdoors in 2021. This proved challenging due to the lack of nearby on-campus sites amenable for this purpose. To dovetail with week two's course materials, PCS took students to a nearby elementary school playground to consider and discuss contrasts between structured (playground) and unstructured (nature) outdoor activity and its relationship to childhood development. In week four, PCS held the session in a nearby outdoor patio area to engage in active listening, observation, and meditation, and consider how the area might be improved to further benefit wildlife such as pollinators. Student evaluations did not specifically comment on these experiences, and they continued to advocate for all classes being held outdoors, weather permitting (Table 2).

In the first year, although nature-deficit disorder was defined and discussed, the idea of doctors prescribing time in nature as a therapeutic option was not introduced. The students in 2020 rightly wondered if this was possible, and whether the course could provide more ideas about how to incorporate what is taught in the course into the practice of medicine (Table 2). After receiving that feedback, PCS identified physicians who incorporate nature prescription into their medical practice and provided videos of these examples in year two, which he thought would also address the interest of the 2020 student class to incorporate more varied media (Table 2). These videos were well-received, generated good discussion, and were mentioned specifically in one student's response about what they liked best about the class. In addition to the positive feedback provided in the course evaluations, one student commented in the facilitator evaluation:

I enjoyed Dr. Swanson's Restorative Recreation class. One important take away was the psychological benefits of nature exposure. Another important lesson was the importance of "walking the walk" with regards to the treatment providers suggest to

their patients. I should engage with the benefits of nature so my behavior is consistent with the belief that nature exposure is good for health. Patients will take a nature prescription more seriously if I actually go out into nature myself.

Another area the students felt could be improved focused on the discussion format. As mentioned above, the M2 students in 2021 rated the course more poorly than the other three student classes. A driving factor for their dissatisfaction was that the classroom discussion focused too much on faculty input on the student discussion question, and not enough peer-to-peer discussion. A response representative of this class's feedback is provided in Table 2. This was due in part to PCS's desire to ensure all students had a fair chance to express their viewpoints, but he also observed students were somewhat hesitant to engage in discussion in the full group setting. He initially thought this would pass as they got to know each other and learned his discussion style. However, seeing no improvement after week 3, PCS pivoted to dividing the class into two subgroups to relate and discuss their questions amongst themselves first, and then had a representative summarize their discussion to the whole group for further reflection and comment. Since the M2 schedule starts two weeks before the M1 group, PCS had a chance to implement this change in week 2 for the M1 students. This strategy appeared to have addressed this issue, as M1 comments in 2021 did not harbor the negative views of the discussion held by the M2 students (Tables 1 and 2).

Analysis of the student's final reflection papers revealed various recurrent themes (Table 3). Those with the most responses largely aligned with the directions for the assignment regarding their reflection on childhood nature experiences, and how nature and integral ecology could be woven into their personal and professional lives. However, these essays also revealed some other unanticipated insights.

One focused on how medical school alters time in nature for medical students, how that affects their well-being, and what happens when they re-engage with nature. Two similar comments stand out in this regard, and are included under the theme "Recognized health benefits of time in nature."

As a representative thematic quote, one student wrote:

I used to believe leisure time in nature was a wonderful pastime for those who enjoyed it and had the time to spare. Since I began reading about the effects of nature on well-being (and especially since beginning the restorative recreation selective), I began to understand how vital time outside is to our health. A few months ago, I started taking hour-long walks outside every day without music or distractions. Previously, I always felt like I had to be multitasking to make effective use of my time. If I took a long walk, I would do flashcards on my phone or listen to recorded notes instead of being aware of my surroundings. I used to worry that taking this time away from studying would harm my performance, but since I added this daily habit I have been doing even better in school, sleeping better, and feeling less easily overwhelmed.

While qualitative, we believe these responses suggest nature prescription for medical students may improve student well-being while also providing an excellent learning opportunity about the restorative potential of nature for their patients.

Other insights focused on the influence of the course in causing student reflection on their own limited childhood exposure to nature, and how the course spurred them to investigate environmental organizations aligning with their interests and to develop their previous nature experiences into productive vocational and avocational endeavors.

These responses suggest the written essays provide insights not readily extracted from open-ended survey questions, and allow the students more freedom to reflect on and express how the course has influenced their thinking.

Discussion

Although there is growing awareness of the importance of contact with nature on personal (student) and patient wellness, the links between

ecological health and human health, the need for strong ethical underpinnings to encourage care for creation, and the interest to develop and incorporate these topics into medical education, examples of classes that systematically address and integrate these issues within one course remain limited. The SIS course described here provides a template to do so in a five-week, discussion-based and experiential class. While the course described here is an elective within a “Gold Track” Medical Humanities curriculum at Creighton University, its short duration would enable it to be relatively easily incorporated into existing medical curricula as a stand-alone course, or potentially as a unit in a larger course devoted to planetary health.

Based on course evaluations, for which response rates were 100%, participating students felt the course met learning objectives, and individual comments provided qualitative evidence that they valued the course both personally and professionally. Some parts of the course content were not highlighted in survey questions or responses, but were reflected in the written essays. As one example, Pope Francis’ writings in *Laudato Si* were not specifically mentioned in any of the open-ended comments on the course evaluation, but several students devoted significant text in their essays to reflecting on the meaning of that reading assignment in their lives, an example of which is provided as the first representative response in Table 3, Thematic Area: “As a future physician, intends to utilize nature as treatment and advocate for nature restoration.” Passages like these illustrate that students are recognizing the connectedness in the writings and ideas explored in the class, and provide solid rationale for including the writing assignment as part of the course.

From analysis of student responses and essays, multiple phrases provide evidence suggesting cognitive awareness of *cura personalis* and the hoped-for outcomes of the UAPs, even if they are not specifically identified. As one example illustrating learner understanding of *cura personalis*, a student wrote that the course “Equipped us with a new way to approach the patient as a whole person. Encouraged us to evaluate our own wellness” [Table 2, Theme “Nature and wellness/medicine”]. As another example, selected passages from essays in Table 3, under Thematic Area: “As a future physician, intends to utilize nature as treatment and advocate for nature

restoration” provide encouragement that UAP#4 “Care of our Common Home” is being learned and embraced by students.

We further believe that the course learning objectives, content, and writing assignments are broadly aligned with Creighton University’s School of Medical program objective centered on “*Personal & Professional Identity Development (PPID)*” that encompasses the Jesuit value of self-reflection (see Appendix A).

PPID1: Develop a habit of cognitive and affective reflection that enhances one’s self-awareness, resiliency, and wellness, as well as one’s understanding of the profession of medicine and the societal context of medical practice.

In hindsight, a shortcoming we identified in using standard medical school evaluation forms for the course assessment is that the questions were not designed to obtain feedback specifically regarding student understanding of Jesuit values, mission, and pedagogy which could have given greater insight into how the course directly addressed these topics. Questions more intentionally developed for this purpose are planned for inclusion in subsequent iterations of the course evaluation.

Key challenges to implementing this class elsewhere include identifying faculty who embrace the importance and linkage of the course topics, and scaling the course to make it accessible to more students. A third obstacle may be identifying suitable outdoor classroom and field trip sites to maximize the experiential value of the course. One might consider this a limitation to generalized instruction. However, we contend the concepts conveyed in the course are broadly applicable, and can be readily adapted to reflect local ecosystems, environmental concerns/cases, and ethical foundations to make it more relevant to students at a given institution.

Conclusions

A short elective course within the medical humanities curriculum at Creighton University was designed to introduce students to the foundational ethics for care of the natural environment described in *Laudato Si’*, and the relationships between nature engagement and human health and well-being discussed in conversations and writings of health professionals and developed through their own experience. Course feedback suggests dedicating time in the medical school curriculum to discuss and reflect on these issues is valuable for students both personally and professionally. Such programming is felt to be applicable and beneficial for all health professions. HJE

Statements and Declarations

- Competing Interests: The authors have no relevant financial or non-financial interests to disclose.
- Ethics approval: This project was reviewed by Social / Behavioral IRB, Submission #2003222-01, and determined as Exempt.

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Appendices

- A. SIS519 Restorative Recreation Course Description
- B. SIS519 Restorative Recreation Faculty Facilitation Guide
- C. Selective Course Evaluation Survey
- D. Selective Faculty Facilitator Survey

Table 2. Themes and Representative Quotes from Medical Student Responses to Open-Ended Postsurvey Questions

Question	Thematic Area	Representative Student Responses
What did you like best about the course? (n=40 responses)	Hitchcock Nature Center [HNC] hike/ outdoor experiences (n=12)	<p>“The trip to HNC on the final day was definitely the best part of the course. It brought together everything we had discussed in the preceding weeks and allowed for a unique experience that enhanced understanding of the course objectives.” (2020, M2 student)</p> <p>“The trip to Hitchcock Nature Center was a nice way to see a restoration in progress and also provided me with time to reflect on nature and its importance.” (2021, M1 student)</p> <p>“I really liked the field trip at the end of the course and felt that it was a good way to tie all concepts of the course together.” (2021, M1 student)</p>
	Course content, structure, and learning environment (n=19)	<p>“I like that this course was different than a typical ‘med school’ course. It was refreshing to learn about things that I did not think I would be taught in med school and also allowed me to meet classmates of mine with similar interests.” (2020, M1 student)</p> <p>“I really liked the discussion-style element of this course, as it was very insightful to get to hear my classmates’ thoughts on different things and it felt guided by our interests.” (2021, M1 student)</p> <p>“I enjoyed the podcast about the local Nebraska energy plant, video about prescribing nature and the TED talk. Basically, all of the videos/podcasts were wonderful, more fun and engaging than reading on average.” (2021, M1 student)</p> <p>“I liked the readings, and I thought the material itself was interesting.” (2021, M2 student)</p>
	Course provides unique perspective/opportunity for personal reflection (n=5)	<p>“I liked looking at nature from a different perspective and seeing how other people interact with it in a positive way that is different from my own” (2020, M1 student)</p> <p>“I really liked how Dr. Swanson asked questions regarding the secondary role that we will play as advocates in our future career as doctors. It was exciting to begin to think about the role that I can play outside of my primary career in areas that I am passionate about. Overall, I thought this was an excellent selective course and I would take it again 10/10 times.” (2020, M1 student)</p> <p>“The unique topic and how it impacted my daily life and goals for the future” (2020, M1 student)</p> <p>“Provided a useful perspective that is different from our other courses” (2021, M2 student)</p>
	Nature and wellness/medicine (n=6)	<p>“I enjoyed talking about how nature and medicine are related.” (2020, M2 student)</p> <p>“Amazing course. Equipped us with a new way to approach the patient as a whole person. Encouraged us to evaluate our own wellness.” (2021, M1 student)</p>

		<p>“I really liked learning about the health benefits of being outside in nature and how some doctors prescribe nature to their patients.” (2021, M1 student)</p> <p>“I like that it emphasized the importance of getting outside, especially for medical students.” (2021, M2 student)</p>
	Presentation on restorative restoration (n=1)	<p>“I really enjoyed Dr. Swanson’s presentation on the parcel of land that he purchased and restored. That was probably my favorite part of the course, and it inspired me to maybe do something similar someday.” (2020, M1 student)</p>
What are some areas where this course could be improved? (n=39 responses)	More classes outdoors/outdoor activities (n=9)	<p>“Overall, I thought that this course was well organized and given the situation with COVID, ran effectively to bring us all together. In a non-COVID world it would have been nice to do more outdoor group activities, but it was not realistic this year.” (2020, M1 student)</p> <p>“This was probably due to COVID but some more outdoor experiences throughout the course would be excellent.” (2020, M2 student)</p> <p>“The only change I’d make would be to hold classes outside, everything else I loved about it!!!!” (2021, M1 student)</p> <p>“I think it would be a nice idea to host the classes outside in the Jesuit Gardens or somewhere else on campus. There was really no reason we had to be inside for the most part, so class periods would be a nice time to [have] some time in nature, at least with weather permitting.” (2021, M2 student)</p>
	Course and discussion structure/format (n=10)	<p>“Sometimes the group breakout rooms weren’t particularly productive. Also, the class sessions could be shorter.” (2020, M1 student)</p> <p>“It would be nice if the instructor provided some of their own discussion questions or topics to think about after reading the articles. I think this would give us ample time to think about our answers to these and lead to a better and more cohesive discussion during our meetings.” (2020, M2 student)</p> <p>“I cannot think of much to be improved. Maybe there could be more structure to the discussions, though I feel like I liked just talking with my classmates and seeing their thoughts.” (2021, M1 student)</p> <p>“We all came to class everyday with discussion questions prepared and ready to share with the class. However, oftentimes I found that when we went around the room to share our discussion questions, the professor would simply provide an answer/explanation to the discussion question, and the other students did not actually get to provide their input on the discussion question.” (2021, M2 student)</p>
	In-person discussion (n=2)	<p>“Zoom discussions are always difficult. In non-COVID years, in-person discussion would be useful.” (2020, M1 student).</p> <p>“I think having in-person discussions next time will be better.” (2020, M2 student)</p>

	Application of content to vocation/medicine (n=2)	<p>“I believe that this could be improved by giving more ideas into how we can incorporate this and make it a vocation in our own lives.” (2020, M1 student)</p> <p>“I know not everything we talk about has to relate to medicine, but it what ways could restorative recreation relate a little bit more?” (2020, M1 student)</p>
	Evolve discussion (n=2)	<p>“I think the class was extremely on topic, just continue to evolve with new information (as the class has done).” (2020, M1 student)</p> <p>“I think that somewhere in the middle of the course we could delve into the more uncomfortable problems regarding conservation and the future of recreation (although in week 3 we did touch on it a little bit). I think that a lot of people don’t want to talk about it due to the fact that the bleakness of our current situation is not very fun to think about, but I think that it is an important conversation to have.” (2020, M1 student)</p>
	Add more varied media (n=2)	<p>“I also think more varied media could be used as I enjoyed the week that had a podcast to listen to.” (2020, M2 student)</p> <p>“Enjoyed the prework for each session, but would have also enjoyed more audio recordings similar to the first session. Otherwise, nothing to recommend!” (2020, M2 student)</p>
	Shorten length of final paper (n=1)	<p>“I would maybe shorten the final paper.” (2020, M2 student)</p>
	More hands-on work (n=1)	<p>“I would appreciate more hands-on work. Perhaps we could contact local businesses to do some volunteer gardening or something similar.”</p>
	No suggestions for improvement (n=10)	<p>“None. The course was very well taught.” (2020, M1 student)</p> <p>“I thought the course was really good overall and can’t really think of any way to improve it.” (2021, M1 student)</p>

Table 3. Themes and Representative Passages from Medical Student Final Essays

Theme	N	Representative Student Passages
Reflecting on exposure to nature through childhood and adolescence has been impactful and foundational to growth	37	<p>“Coming into medical school, making time to be outside became very intentional as all I felt like I had time for was sitting inside to study. In my schedule, especially because of this course, I remembered how important all these past experiences of being outdoors has been for my wellness.”</p> <p>“Nature is something that has always been an integral part of my life, especially while growing up. Given that my mom was a stay-at-home mom, whenever it was nice outside, she would encourage us to go outside and be active. This either involved taking us to a local park or simply encouraging my brother and I to go outside and play soccer with the neighborhood kids. Although these weren’t technically mindful practices in nature like this course has taught me, they still stimulated in me a desire to be active and outside whenever I got that chance. By going to local parks or sitting outside on the porch enjoying the fresh air with friends or by myself, I was able to continuously keep this connection to nature alive. It was the experiences with nature that I had by myself though that showed me the overall true benefits it can have on someone’s well-being and it was this curiosity to know more about these benefits that got me interested in this course.”</p>
As a future physician, intends to utilize nature as treatment and advocate for nature restoration	32	<p>“As an aspiring physician, one of my goals will be to promote an understanding of integral ecology in both my patients and my community. According to the <i>Laudato Si’</i>, the definition of integral ecology is that humans are inseparably connected with the natural world. Therefore, it is logical to conclude that our well-being is directly related to the well-being of nature. Fostering an understanding of this integral ecology can lead to an ‘ecological conversion,’ where people take responsibility in caring for the natural world. In essence, by caring for the natural world, we are caring for ourselves. Many people are not aware of the benefits of spending time in and caring for the environment. I believe the primary reason for this has to do with the society that humans have created. Our society is fast-paced, competitive, and consumeristic. People are often so concerned with their own lives that they are unable or unwilling to take time to engage with nature. This overconcern with ourselves leads to increased stress levels, which I believe is a strong contributor to the high prevalence of anxiety, depression, and other stress related diseases currently seen in our society, even though one could argue that society is quite prosperous. As a physician, I expect mental health to be a major issue amongst my patients. In my own experience, spending time in nature is one of the best ways to combat anxiety and depression brought about by high stress levels. I will encourage my patients to spend time outside, away from technology, in the hope that they will learn to appreciate the beauty of the natural world. Perhaps this will lead to an understanding of integral ecology, which may then lead to an ecological conversion. If my patients can adopt responsibility for the natural world, they may be able to shift their focus away from their own lives, which may then reduce their stress levels. Reduced stress will lead to reduced anxiety and depression. This is the eventual goal of a so-called ‘nature prescription.’”</p> <p>“As a future physician, I am excited to eventually be considered a leader of healthcare in my community. This puts me in a great position to advocate for restoration projects like creating trails within the city, and garnering support for organizations like TFNU. It is my hope that as I build my vocation as a physician, I would also get to build my avocation as an advocate for natural restoration. As someone whose mental and physical health has benefited tremendously from hiking, I would advocate for local restorative organizations and community restorative projects. It is also my hope that I will have the time to volunteer with local programs and establish new trails or nature centers. Projects like the Hitchcock Nature Center</p>

		<p>in Honey Creek, Iowa are inspiring because it makes one realize that they can create a change in their environment. It is the work of such heroes that allows the average citizen to experience the rich red sumac plants among the tall grass—like the dilated blood vessels of the Loess Hills—instead of a landfill.”</p> <p>“As I go forward into my profession as a physician, I want to always be aware of the effects of nature on every person. I want to integrate it into the way I practice medicine as well as taking care of myself. When I picture myself 10 to 20 years from now, I see myself owning a house farther out from the city with a plot of land that I can cultivate and restore, such as Dr. Swanson did in his own plot of land. I want this plot of land to be a place of refuge for many species, including my own family. [...] When it comes to lifestyle, it is often emphasized to eat well and to exercise often, but I believe that developing a connection to nature can be equally important, especially to those who do not have direct access to it. As a future physician I will be in a specific niche of society that will provide me with unique opportunity to educate individuals on the ideologies of integral ecology. By utilizing a patient’s chief complaints, social history, and other holistic factors I will be able to educate patients on the potential benefits of outdoor activities as a supplement in aiding in their overall health and well-being; indirectly re-introducing individuals to the beauty of nature and how we are actually one with it, opposed to separate entities. As a direct result of discussing the words of and reading about the ideologies and ideas of Dr. Louv, I will also be able to discuss with patients about how to re-introduce their own nature in areas that are nature-depleted, or that lack safety associated with being outdoors.”</p>
Intends to incorporate integral ecology/nature into lifestyle	22	<p>“I became interested in the concept of restorative recreation when I read the course title because I believe in the importance of recreation in nature to development and a balanced life. I saw restorative recreation as a potential antidote to lifestyle contributions of neuroticism and workaholism which modern life can lead to. I have strived to integrate activities within nature to my hobbies and routines.”</p>
Course improved understanding of concepts	19	<p>“Towards the end of our course, I appreciated the distinction between being a passive recipient of nature’s benefits and an active steward of the world which we have been given. This distinction became clear as we considered Dr. Swanson’s work on restoring prairielands that have been lost to the gradual local spread of farmland.”</p> <p>“Writing doesn’t really allow me to fully illustrate how I feel in nature or how exactly it affects me and everyone else. Regardless, I have learned to appreciate the peace and serenity in nature and am trying to maintain it so future generations can enjoy it too. By improving waste I have and being mindful of my consumption and how to minimize it as well, I think I’ll be following Pope Francis’s admonition and planting seeds for later generations to enjoy nature as I have.”</p>
Began to research environmental initiatives, policy, and organizations	6	<p>“With a new fervor for natural restoration, I began to research organizations that maintained hiking trails in my hometown of Ogden. I was very pleased to find out about the Trails Foundation of Northern Utah (TFNU), a non-profit organization that works with private landowners, local organizations, and volunteers to create and preserve hiking trails.”</p> <p>“I did some research and found the Nigerian Conservation Foundation which is based in Lagos and their mission and vision are very much in line with some of the values I have learned from taking this course. They are based in Lagos a city I visit often and one where a lot of my extended family resides. I can definitely see myself helping that group long term. On a more personal level there are little things I can do on a day to day basis to promote integral ecology, recycling, producing less waste, purchasing local and organic food items and doing whatever I can to minimize my carbon footprint and that of those around me.”</p>

<p>Recognized health benefits of time in nature</p>	<p>5</p>	<p>“While the long days and nights of studying seemingly endless material in medical school has been challenging, it has opened my eyes to something. Without the time or ability to access nature on any sort of regular basis, I found my mental health and motivation to be lower than it ever had been before. The weeks of continuous studying grew on me after some time, and I began to feel drained. This experience made me quickly realize and understand just how important it is to remain connected with nature. During my second year of medical school, I made it my goal to do my best to get outside, even if it was just a simple walk every now and then, so that I could maintain my sanity and delay (or hopefully prevent) burn out.”</p> <p>“I used to believe leisure time in nature was a wonderful past time for those who enjoyed it and had the time to spare. Since I began reading about the effects of nature on well-being (and especially since beginning the restorative recreation selective), I began to understand how vital time outside is to our health. A few months ago, I started taking hour-long walks outside every day without music or distractions. Previously, I always felt like I had to be multitasking to make effective use of my time. If I took a long walk, I would do flashcards on my phone or listen to recorded notes instead of being aware of my surroundings. I used to worry that taking this time away from studying would harm my performance, but since I added this daily habit I have been doing even better in school, sleeping better, and feeling less easily overwhelmed.”</p> <p>“I believe nature has contributed greatly to my health, well-being and personal growth. Being outdoors and having access to parks has kept me active and kept my mind fresh. Seeing the vastness of nature has given me a certain perspective on the world. I can just stare at the mountains for long periods of time, realizing how insignificant I am in this large world. Nature has influenced me in all these ways- and I took this course to learn more about the role nature plays in our lives. Because of the positive impact it has made on mine, I want to help ensure that everyone has access to nature and understands the important role it plays in our health.”</p>
<p>Course allowed for reflection on experiences with nature and how it can enhance the lived experience</p>	<p>5</p>	<p>“The past five weeks discussing nature has been an enlightening experience where I have been able to dwell on my past experiences with nature and learn how I can develop these past experiences into a productive avocation that can produce similar memories for my family while also being a good steward over the Earth.”</p> <p>“This course has made me seriously think about developing or promoting Ecological Conversion in my professional life”</p> <p>“I’ve known nature to be a saving grace for me throughout my years of graduate school and the first semester of medical school; however, I have never considered seeing it in a medical light. The class made me take a more serious approach to my interest and think about sharing it with others. It has also opened my eyes to the potential of prescribing green time and taking time to educate patients.”</p>
<p>Childhood exposure to nature was limited</p>	<p>4</p>	<p>“I was not raised in a household that lived and breathed the outdoors. We would go camping every few years but that was the extent of most of my experiences with nature growing up.”</p> <p>“Growing up in Los Angeles, California, I became accustomed to the hustle and bustle of the city. The unrelenting sound of traffic, the sound and lights of stores that never close, and the smog-filled gray sky became all too comforting. Most attractions in Los Angeles are within the city, and as such, fun meant going to arcades or to the local park. Occasionally, my family would go to the beach, and this was about as much nature experience as I got. Part of the reason for this was because my own</p>

		parents—the cautious people that they were—did not have a reason to go out of the city when everything was so close to them.”
Need for change/activism	4	<p>“Sadly, there are too many people today that lack access to such opportunities and the next generation suffers. There are so many advantages to play in nature over computer games and other indoor games yet so many kids simply don’t get outside. I am saddened when I go out and see children stuck on their parents’ phones. It is disheartening to meet people who say they have never been camping or slept outside before. I treasure these experiences and see it as part of the human experience and as a way to recenter one’s self. It is not surprising the rates of mental illness and outdoor exposure are correlated.”</p> <p>“The worldwide decline in biodiversity is both a very sad and worrisome reality of the Anthropocene. Previously, I had thought of it as a problem that was much too large for me to make a difference. However, this course has made me reconsider some of the actions I could take to help solve the issue while simultaneously allowing me to pursue an avocation outside of medicine.”</p>
Enjoyed hike at the Hitchcock Nature Center	3	<p>“My time at the Hitchcock Nature Center was the first real change in my nature exposure this year. This trip in a way brought me back to my roots. It is a rather simple plan, but I will try to go on a nature trip once a month. Nature trips do not need to be grand gestures to national geographic views in the mountains. They can be simple intentional trips just outside Omaha. I have made many sacrifices during medical school, but sacrificing my time in nature no longer will be one of them.”</p> <p>“The hike was a ton of fun and the Hitchcock Nature Center was more beautiful than I thought it would be.”</p>
When younger, nature was a means to socialize	2	<p>“I was 13 years old when we moved, and Ogden became the new place of my formative years. I quickly learned that Utahns love to go hiking, snowboarding, and mountain biking in the gorgeous mountains that loom over the cities. There were less people in the suburb that I lived in, and in order to fit in with my friends, I began exploring my local mountains. For the longest time, hiking was a rare event for me—up until I graduated.”</p>

Appendix A. SIS519 Restorative Recreation Course Description

Restorative recreation: Caring for yourself while caring for our common home SIS 519

Credit Hours: 0.5

Academic Year 2020-2021

Brief Description (~50 words) for Course Catalogue

Through an exposure to relevant primary literature, popular media writings, academic talks, outdoor experiences, and through reflective writing and discussion, students will explore the importance of nature contact to human health, and how restorative recreation activities can achieve a dual purpose of caring for one's self and caring for our common home.

Purpose

This course introduces students to the concept euphemistically termed “nature deficit disorder” (note that this is not formally recognized as a medical diagnosis) and the impacts of an increasing disconnectedness to nature on human health, and the how nature immersion can ameliorate these effects. The groundwork for changing our relationship to nature will be discussed in the context of Pope Francis’ encyclical *Laudato Si’ On Care for Our Common Home*. Students will be introduced to practical approaches to increasing awareness of native ecosystems, engaging in restorative recreation activities, and the benefits to self, community, and place that come from these efforts. Students will be graded on their participation—which includes reading all materials before class meetings and preparing discussion questions for group discussions—as well as submission of a final reflection paper.

Course Goal

Through independent and collaborative inquiry into the relationship between nature contact and human health, the emergent themes in selected readings in *Laudato Si’*, and the links between ecological and human restoration, students will be able to achieve the Selective Objectives listed in the table below:

Selective Objectives	Educational Program Objectives	Assessment Method
Medical Knowledge (MK)		
<ul style="list-style-type: none"> Identify the origin of the term “nature deficit disorder,” discriminating it from a medical diagnosis, and understand its meaning, causes, and consequences 	MK2	<i>Reflection</i>
<ul style="list-style-type: none"> Define the benefits of nature contact to human health 	MK3	<i>Direct Observation</i>
Personal & Professional Identity Development (PPID)		
<ul style="list-style-type: none"> Reflect on what an “Integral Ecology” and an “Ecological Conversion” looks like and how it relates to <i>Care for Our Common Home</i> 	PPID-1	<i>Direct Observation</i>
<ul style="list-style-type: none"> Identify practices that are restorative to self, community, and natural ecosystems 	PPID-1	<i>Reflection</i>

Selective Objectives

Activities & Instruction

- Small group discussion of course materials (readings, lectures, etc.). Each student should write two or three discussion questions prior to each session for group discussion.
- Final reflection paper answering the question “What influences led to your interest in nature and how do you see yourself working to promote an Integral Ecology as an avocation?” 1,200-1,500 words, double spaced, 12pt font.

Class Schedule & Reading Assignments

Class sessions meeting in small group room space – Cardiac Center Room 265 [M2]

Week 1 (August 31 [M2]; September 13 [M1]): Nature Deficit Disorder

What is Nature-Deficit Disorder? Richard Louv interview on WYPR:

<https://www.wypr.org/post/adults-and-nature-deficit-disorder>

Martha Driessnack, “Ask the Expert: Children and Nature-Deficit Disorder,” *Journal for Specialists in Pediatric Nursing* 14, no. 1 (Jan 2009): 73-5, <https://doi.org/10.1111/j.1744-6155.2009.00180.x>.

Leading discussion question: Compare and contrast “Nature Deficit Disorder” to a recognized medical diagnosis, for example ADHD. Can Nature Deficit Disorder be diagnosed? Why or why not?

Week 2 (September 7 [M2]; September 20 [M1]): Nature Immersion and Nature Prescription – Approaches to Improve Human Health

Nature Immersion

Jim Robbins, “Ecopsychology: How Immersion in Nature Benefits Your Health,” *Yale Environment 360* (January 9, 2020), <https://e360.yale.edu/features/ecopsychology-how-immersion-in-nature-benefits-your-health>

Nature Prescription

Dr. Nooshin Razani

<https://www.youtube.com/watch?v=0uk0QriYYws>

Dr. Robert Zarr

<https://takecare.org/inspiration/nature-no-app-required/>

Additional info if interested, related to Dr. Zarr’s talk (not required)

<https://www.parkrx.org/>

Week 3 (September 14 [M2]; September 27 [M1]): Selected readings from Laudato Si’ On Care For Our Common Home

Chapter 1. Paragraphs 20, 25, 26, 28-30, 32, 33, 36, 43-45, 48,

Chapter 2. Paragraphs 67, 84, 85, 97,

Chapter 3. Paragraph 116

Chapter 4. Paragraphs 137-139, 156, 157, 159, 160

Chapter 6. Paragraph 212, 217, 225

Review regional case study of Mead NE, AltEn LLC and reflect on how this case exemplifies (or not) the issues discussed in Laudato Si’.

<https://nebraskapublicmedia.org/en/news/news-articles/the-smell-of-money-mead-nebraskas-fight-for-its-future/>

Week 4 (September 28 [M2]; October 4 [M1]): Restorative Recreation – Avocational Opportunities to Restore Self, Community, and Ecosystems

I.C. McManus, Hallgeir Jonvik, Peter Richards, and Elisabeth Paice. “Vocation and avocation: leisure activities correlate with professional engagement, but not burnout, in a cross-sectional survey of UK doctors.” *BMC medicine* 9, no. 1 (2011): 1-18.

Patrick C. Swanson, “Restorative Recreation: One Landowner’s Experience Restoring a Cedar-Infested Native Prairie Remnant in Iowa’s Loess Hills.” *Ecological Solutions and Evidence* 2, no. 2 (2021): e12063, <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/2688-8319.12063>

Week 5 (October 5 [M2]; October 25 [M1]): Field trip to Hitchcock Nature Center.

Hike along Badger Ridge Trail to experience Loess Hills topography and observe native plants. There is a nominal entrance fee to Hitchcock Nature Center (currently \$5/vehicle).

Walks to on-campus sites to view and discuss wildflower plantings will be offered as an alternative.

Grading

Satisfactory (SA)	Student completes all required components of the course in a satisfactory manner by meeting the established passing requirement for assignments.
Unsatisfactory (UN)	Student does not complete required components of the course or completes the requirements in a manner that is below the established passing requirement for assignments.
Incomplete (I)	This grade is temporarily assigned to students granted an extension to complete elective requirements <ul style="list-style-type: none"> • changed to SA when all required coursework completed • changed to UN if required coursework not completed or unsatisfactory in completion

CUSOM Policies

View the CUSOM Student Handbook [online](#).

Appendix B. SIS519 Restorative Recreation Faculty Facilitation Guide

For small group discussion times are listed in the sessions. Divide the class in half (≤ 6 students for a capped enrollment of 12 students).

Session 1.

Hour 1.

Introductions (~30 min) – ask the students to introduce themselves, what led them to enroll in this course, and what childhood experiences led to an interest in nature.

Hour 2.

~30 min. Richard Louv small group discussion. Have each student present a discussion question or present their thoughts about the Richard Louv interview, particularly, what they found most interesting or what they learned.

~15 min. Richard Louv large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Some follow-up guided discussion questions. In the interview, Richard Louv introduces the idea that nature is experienced with multiple senses. Do you fully experience nature when you have headphones on, for example? How many senses are there that one might use in nature? This leads to a discussion of how many senses there are: beyond the classical five (sight, hearing, smell, taste, touch), others might include thermoception (sense of heat), nociception (sense of pain), equilibrioception (sense of balance), proprioception (sense of body awareness), and other bodily senses (e.g. hunger, thirst, humidity, etc).

~30 min. Driessnack paper small group discussion. Have student break up into smaller groups (6 students). Have each student provide their response to the leading discussion question: Compare and contrast “Nature Deficit Disorder” to a recognized medical diagnosis, for example ADHD. Can Nature Deficit Disorder be diagnosed? Why or why not?

~15 min. Driessnack paper large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Some follow-up guided discussion questions. In reflecting on your own childhood and adult experiences in nature, how have these experiences influenced your development and sense of well-being?

Session 2.

Note: this may be a good opportunity to hold class outdoors.

Hour 1.

~40 min. Nature Immersion – Have each student present a discussion question or present their thoughts about the article by Jim Robbins, “Ecopsychology: How Immersion in Nature Benefits Your Health,” *Yale Environment 360* (January 9, 2020), <https://e360.yale.edu/features/ecopsychology-how-immersion-in-nature-benefits-your-health>

Some follow-up guided discussion questions. Ask students to also discuss how they experience the outdoors currently. What makes a good nature immersion experience? If outdoors, is the space conducive to nature immersion – why or why not?

~20 min. Nature Immersion – large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Hour 2.

~40 min. Nature Prescription small group discussion. Have each student present a discussion question or present their thoughts about the short films on Nature Prescription, particularly about what they found most interesting or what they learned.

Some follow-up guided discussion questions. Ask students to also discuss how they could modify their hospital/clinic space to provide more calming nature spaces/scenery for patients. This topic is introduced in Dr. Razani's TEDx talk.

~20 min. Nature Prescription large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Session 3.

Hour 1.

~40 min. *Laudato Si' On Care for Our Common Home* small group discussion. Have each student present a discussion question or present their thoughts about Pope Francis' encyclical

Some follow-up guided discussion questions. Ask students to discuss how *Laudato Si'* defines "Integral Ecology" and "Ecological Conversion". What would it require to achieve this in everyday life?

~20 min. *Laudato Si'* – large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Hour 2.

~40 min. Mead NE, AltEn LLC small group discussion. Have each student present a discussion question or present their thoughts about the news article, "The Smell of Money." In what ways does this case exemplify (or not) the issues discussed in *Laudato Si'*?

Some follow-up guided discussion questions. Are there other examples of environmental degradation that have affected you personally or areas where you grew up?

~20 min. Mead NE, AltEn LLC large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Session 4.

Note: this may be a good opportunity to hold class outdoors.

Hour 1.

~40 min. Vocation and avocation – small group discussion. Have each student present a discussion question or present their thoughts about the article by McManus *et al.* What are major conclusions from the study? Discuss specifically how an avocation differs from a vocation, and why Sir William Osler felt it was important for physicians to have an avocation.

Some follow-up guided discussion questions. Ask students to also discuss what are the features of a good avocation and how one would incorporate an avocation into a career in medicine.

~20 min. Vocation and avocation – large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Hour 2.

~40 min. Restorative recreation – small group discussion. Have each student present a discussion question or present their thoughts on the article by Swanson.

Some follow-up guided discussion questions. Particularly if class is held outside, ask students to also discuss how they could develop the outdoor space to make more *restorative* to nature and to self.

~20 min. Restorative recreation - large group debrief. Have a member from each group briefly report the major ideas/feedback from the discussion.

Session 5.

In this course, the hike takes place at Hitchcock Nature Center, which is a ~30-minute drive from Omaha. The students are asked to meet, carpool, and caravan together to the site. The visit is associated with a nominal entrance fee. The rationale for visiting this location is that it retains native vegetation, and has a land use history that has included both degradative and restorative work.

A short pre-visit PowerPoint is posted to document land use history with available historical photos. In 2021, a naturalist accompanied our group. During the first half of the hike (30 min), I and the naturalist identify native plants, show ongoing restoration work at the site, describe visitor trends during the COVID pandemic, highlight local land use issues, and discuss what individuals can do to improve the ecosystem. During the second half of the hike (~30), I encourage the student to walk silently, actively listen for wildlife, contemplate the senses they are using to experience the walk, and appreciate the beauty of the landscape. Before each part of the hike, I remind the student to reflect on the topics discussed in class, including nature immersion, nature prescription, restorative restoration, and the moral and ethical foundations of creation care promulgated in *Laudato Si'*. I bring the students to the visitor's center where they can linger if they choose (especially if it has a scenic overlook), but are able to return to campus.

Expert Recommendations

The following suggestions may be helpful to prepare students for the hike.

Recommend students wear long pants, sturdy walking shoes, and sunscreen.

Bring a water bottle.

Depending on local conditions, insect repellent may be necessary.

In discussion questions, students wondered how they can learn more about nature or get involved if they are not familiar with or uncomfortable about local outdoor opportunities. A nature center (like HNC) has many volunteer and educational opportunities (which is one reason to bring students there). In addition, when emailing directions, one can include a document with links to several local organizations that often host events that may be of interest. Another suggestion is to include links to online flower guides use for plant identification. There are many other online guides and identification tools.

Appendix C. Selective Course Evaluation Survey

Please rate the following items on a scale from “1” Strongly Disagree to “4” Strongly Agree.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
1. The syllabus was well organized and an accurate guide to course requirements.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The course design, organization, and sequence facilitated my learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Course learning goals and objectives were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In general, learning goals and objectives were met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Course assignments contributed to my learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. This course offered a positive and constructive learning environment (e.g., respectful and collegial).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. This selective expanded my understanding of the role of physicians in healthcare.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The elective director(s) were effective teachers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Overall, this course offered a positive learning experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. What did you like best about this course?

2. What are some areas where this course could be improved?

Appendix D. Selective Faculty Evaluation Survey

Please rate the following items on a scale from “1” Strongly Disagree to “4” Strongly Agree.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
1. This faculty member was effective in facilitating group discussion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. This faculty member welcomed and encouraged me to make contributions to the group discussion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. This faculty member provided me with timely and constructive feedback.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. This faculty member promoted a positive and constructive learning environment (i.e., respectful; free of threats, harassment, discrimination, belittling comments).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. This faculty member integrated care for patients from diverse backgrounds in their teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Overall, this faculty member was an effective educator.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. Please comment on how this faculty member and/or their teaching promote or distract from a learning environment that is inclusive and sensitive to the experience of students and patients from diverse backgrounds.

2. Please provide any specific and constructive comments for this educator.

Endnotes

- ¹ Danielle G. Rabinowitz, “On the Arts and Humanities in Medical Education,” *Philosophy, Ethics, and Humanities in Medicine* 16, no. 1 (June 30 2021): 4, <https://doi.org/10.1186/s13010-021-00102-0>.
- ² Anna Goshua, Jason Gomez, Barbara Erny, Marshall Burke, Stephen Luby, Susanne Sokolow, A. Desiree LaBeaud, et al., “Addressing Climate Change and Its Effects on Human Health: A Call to Action for Medical Schools,” *Academic Medicine* 96, no. 3 (Mar 1 2021): 324-28, <https://doi.org/10.1097/ACM.0000000000003861>.
- ³ Gregory N. Bratman, Christopher B. Anderson, Marc G. Berman, Bobby Cochran, Sjerp de Vries, Jon Flanders, Carl Folke, et al., “Nature and Mental Health: An Ecosystem Service Perspective,” *Science Advances* 5, no. 7 (July 2019): eaax0903, <https://doi.org/10.1126/sciadv.aax0903>; Terry Hartig, Richard Mitchell, Sjerp de Vries, and Howard Frumkin, “Nature and Health,” *Annual Review of Public Health* 35 (2014): 207-28, <https://doi.org/10.1146/annurev-publhealth-032013-182443>.
- ⁴ Norman Frederick, “Teaching Social Determinants of Health through Mini-Service Learning Experiences,” *MedEdPORTAL* (2011), https://doi.org/10.15766/mep_2374-8265.9056.
- ⁵ Parvathy Pillai, Johnathan A. Patz, and Christine S. Seibert, “Climate Change and Environmental Health Must Be Integrated into Medical Education,” *Academic Medicine* 96, no. 11 (Nov 1 2021): 1501-02, <https://doi.org/10.1097/ACM.0000000000004238>; Kimberly S. Gehle, Jewel L. Crawford, and Michael T. Hatcher, “Integrating Environmental Health into Medical Education,” *American Journal of Preventative Medicine* 41, 4 Suppl 3 (2011): S296-301, <https://doi.org/10.1016/j.amepre.2011.06.007>; David Klee, and Kelly Hirko, “Outdoor Walking Rounds: Combining Resident Education and Wellness,” *The Clinical Teacher* 18, no. 1 (Feb 2021): 51-54, <https://doi.org/10.1111/tct.13232>.
- ⁶ William Osler, *Aequanimitas: With Other Addresses to Medical Students, Nurses and Practitioners of Medicine* (London: H. K. Lewis, 1932); Francis, *Laudato Si': On Care for Our Common Home, Encyclical Letter* (Vatican City, Italy: Libreria Editrice Vaticana, 2015), http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html.
- ⁷ Arturo Sosa S.J., “Universal Apostolic Preferences of the Society of Jesus, 2019-2029,” (February 6, 2019), <https://www.jesuits.global/uap/introduction/>.
- ⁸ Richard Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, (Chapel Hill, N.C.: 2008).
- ⁹ Francis, *Laudato Si'*, secs. 1, 4, 6, http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html.
- ¹⁰ Patrick Swanson, *One Man and a Chainsaw: A Journey in Faith and Prairie Restoration*, Self-published, 2018, <https://www.amazon.com/One-man-chainsaw-journey-restoration/dp/1722770015>; Patrick C. Swanson, “Restorative Recreation: One Landowner’s Experience Restoring a Cedar-Infested Native Prairie Remnant in Iowa’s Loess Hills,” *Ecological Solutions and Evidence* 2 (2021): e12063, <https://doi.org/10.1002/2688-8319.12063>.
- ¹¹ Richard Louv, “Adults and Nature Deficit Disorder,” *Midday with Dan Rodricks*, National Public Radio, March 3, 2021, <https://www.wypr.org/show/midday-with-dan-rodricks/2021-03-12/adults-and-nature-deficit-disorder>.
- ¹² Martha Driessnack, “Ask the Expert: Children and Nature-Deficit Disorder,” *Journal for Specialists in Pediatric Nursing* 14, no. 1 (Jan 2009): 73-5, <https://doi.org/10.1111/j.1744-6155.2009.00180.x>.
- ¹³ Jim Robbins, “Ecopsychology: How Immersion in Nature Benefits Your Health,” *Yale Environment 360* (January 9, 2020), <https://e360.yale.edu/features/ecopsychology-how-immersion-in-nature-benefits-your-health>; Nooshin Razani, “Prescribing Nature for Health,” (TEDxNashville, June 14, 2016), <https://www.youtube.com/watch?v=0uk0QriYYws>; *Nature: No App Required*, directed by Jonathan Halperin and Mark Mannucci, Healthy US Collaborative, Inc, 2019, <https://takecare.org/inspiration/nature-no-app-required/>.
- ¹⁴ Nooshin Razani, Kian Niknam, Nancy M. Wells, Doug Thompson, Nancy K. Hills, Gail Kennedy, Rachel Gilgoff, and George W. Rutherford, “Clinic and Park Partnerships for Childhood Resilience: A Prospective Study of Park Prescriptions,” *Health Place* 57 (May 2019): 179-85, <https://doi.org/10.1016/j.healthplace.2019.04.008>; Eugenia C. South, Michelle C. Kondo, and Nooshin Razani, “Nature as a Community Health Tool: The Case for Healthcare Providers and Systems,” *American Journal of Preventative Medicine* 59, no. 4 (Oct 2020): 606-10, <https://doi.org/10.1016/j.amepre.2020.03.025>; Robert Zarr, Linda Cottrell, and Chaya Merrill, “Park Prescription (Dc Park Rx): A New Strategy to Combat Chronic Disease in Children,” *Journal of Physical Activity and Health* 14, no. 1 (Jan 2017): 1-2, <https://doi.org/10.1123/jpah.2017-0021>.
- ¹⁵ “The Smell of Money: Mead, Nebraska’s Fight for Its Future,” Nebraska Public Media, Aug. 4, 2021, accessed January 6, 2022, <https://nebraskapublicmedia.org/en/news/news-articles/the-smell-of-money-mead-nebraskas-fight-for-its-future/>.
- ¹⁶ I. C. McManus, Hallgeir Jonvik, Peter Richards, and Elisabeth Paice, “Vocation and Avocation: Leisure Activities Correlate with Professional Engagement, but Not Burnout, in a Cross-Sectional Survey of Uk Doctors,” *BMC Medicine* 9 (Aug 30 2011): 100, <https://doi.org/10.1186/1741-7015-9-100>.
- ¹⁷ Swanson, “Restorative Recreation.”
- ¹⁸ Lee J. Cronbach, “Coefficient Alpha and the Internal Structure of Tests,” *Psychometrika* 16 (1951): 297-334, <https://doi.org/https://doi.org/10.1007/BF02310555>; Riju R. Menon, Suja Gopalakrishnan, Unnikrishnan K. Menon, Poornima B, Anu Sasidharan, C. Sumithra, Natasha Radhakrishnan, and Suchitra Sivadas. “Preparation and Validation of a New Questionnaire to Study Faculty Perception of Online Teaching – Use of Cronbach’s Alpha and Pilot,” *Medica Innovatica* 10, no. 2 (2021): 1-6.