

# BNHC E-MAGAZINE

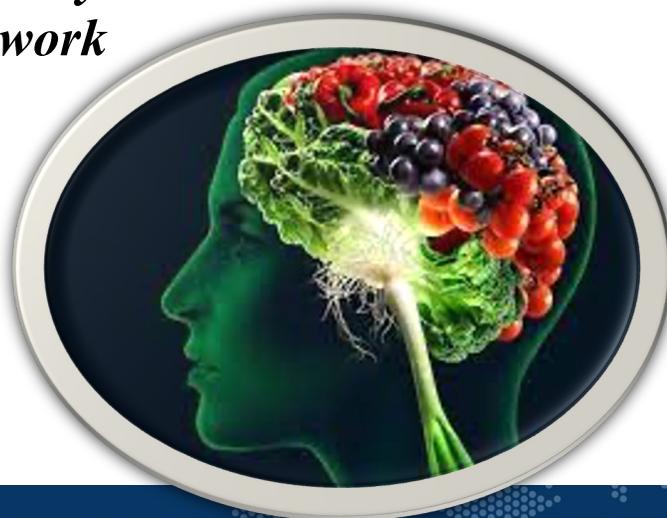
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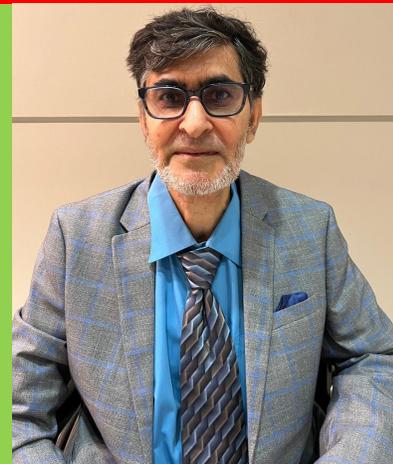
**BioNatural Healing College (BNHC)**

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# Message: from the President of BioNatural Healing College (BNHC)

Greetings!



I am thrilled to express my heartfelt gratitude to the Almighty God for granting me the privilege to introduce the BioNatural Healing College (BNHC) E-Magazine September 2024 edition to our esteemed readers. Additionally, I extend my thanks to each one of you, especially our cherished readers, for your invaluable feedback and unwavering support. It's important to emphasize that the content within this magazine is intended solely for educational purposes, the author's perspectives are independent of any affiliation with BNHC.

We have high hopes that this BNHC E-Magazine will prove to be a valuable resource, made possible by the diligent contributions of esteemed researchers and colleagues from across the globe. With gratitude, I wish you all the best in health and a life filled with prosperity.

Warmest regards,

Dr. Nadir Sidiqi, Ph.D.



# BioNatural Healing College

## **BioNatural Healing College Stands on Seven Core Pillar Foundations as follows:**

1. All living organisms are made from the water this beautiful connection, connects us to praise the Creator of Creation for the provision of feeding, fueling, and healing to humanity.
2. No harm to public health and environmental health (Biodiversity) including pollinators, surface water, groundwater, soil, and air.
3. A series of complex chains involved with food production from the field to the mouth of the human body desperately needs scientific research to maximize healthy nutritionally food production and end malnutrition and food insecurity.
4. Harmful pests such as insects, and pathogens causing to human and plant health and loss of economic problems. BioNatural chemicals from plants, microorganisms, and ocean-living organisms exist and need further research to discover along with safety to utilize for the health improvement of humans as well as BioNatural Pest Management (insects, fungi, bacteria, various, nematodes, weeds, rodents, etc.).
5. Listen, love, appreciate, and respect with deep conscience and subconscious the connection between the genes of your body and beautifully ecologically in sense of feeling, feeding, fueling, and healing.
6. The brilliant human mind can irrigate with balance drinking clean water as a whole-body system to detoxify the toxicant from their body systems as well as to detoxify the soil, water, and environment from harmful chemicals, particularly pesticides through collaboration, and dedication from the individual, family, community, and scientific community locally and globally.
7. BioNatural Healing College provides a high-quality science base foundation through online education to fit and accommodate the needs of each prospective student for the sustainability and prosperity of his or her own, family, community, and humanity.

# The Remarkable Connection Between the Human Brain, Artificial Intelligence and Agriculture

By Dr. Nadir Sidiqi Ph.D.

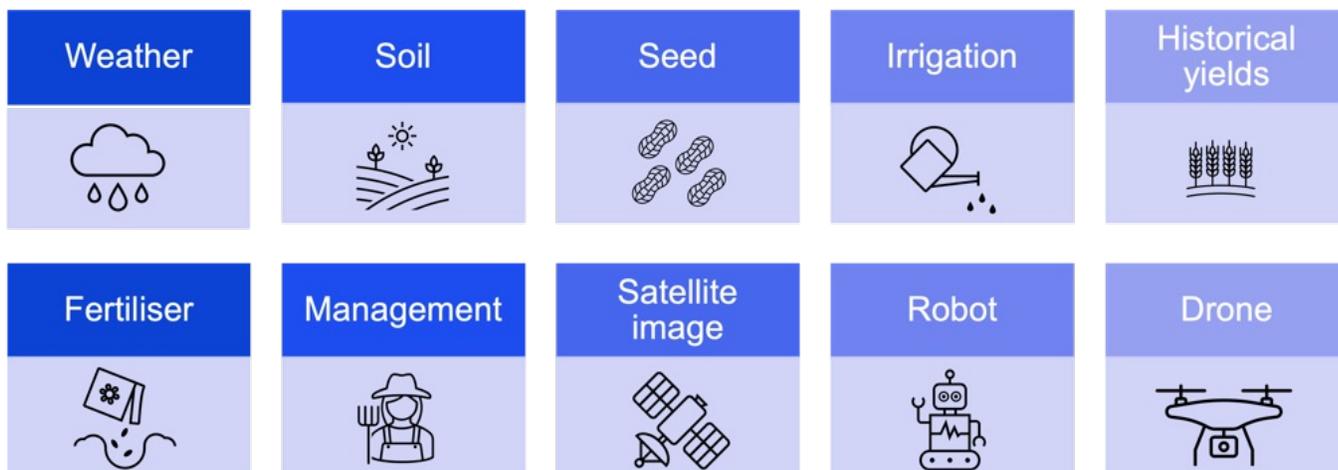
**Introduction:** Learning and sharing of knowledge are the two neurobiological interactions that the Creator of creation (Almighty God) gifts human beings to benefit each other for a good cause, therefore, it's hoped this September BNHC E-Magazine edition will be a useful article to dear readers. Humans are blessed with the great gift of brain power, which is a vital organ, part of the central nervous system (CNS) of the human body which includes five senses: sight, smell, sound, touch, and taste. It interprets information such as thoughts and decisions, memories and emotions, movements (motor function), balance and coordination, speech and language function, perception of various sensations including pain, automatic behavior breathing, heart rate, sleep, and temperature control, fight or flight response (stress response), and regulation of organ function and more are all functions of this blessed gift that Creator of creations is bestowed upon His noble creature the human body, particularly the brain. For example, artists use their imagination and creativity to draw a state-of-the-art visual painting of a garden with various beautiful flowers and landscapes including fruits and vegetables using multiple materials such as paint, glass, clay, paper, fabric, wood, etc. Indeed, this art of creativity of humans has been an enjoyable activity for many centuries. Thus, human beings with all novelty qualities have a fundamental connection to the earth. Surprisingly, human beings have been created with weak physiological and psychological needs to survive on Earth. These needs include air (to breathe), water, food, sleep, and prosperity in life.

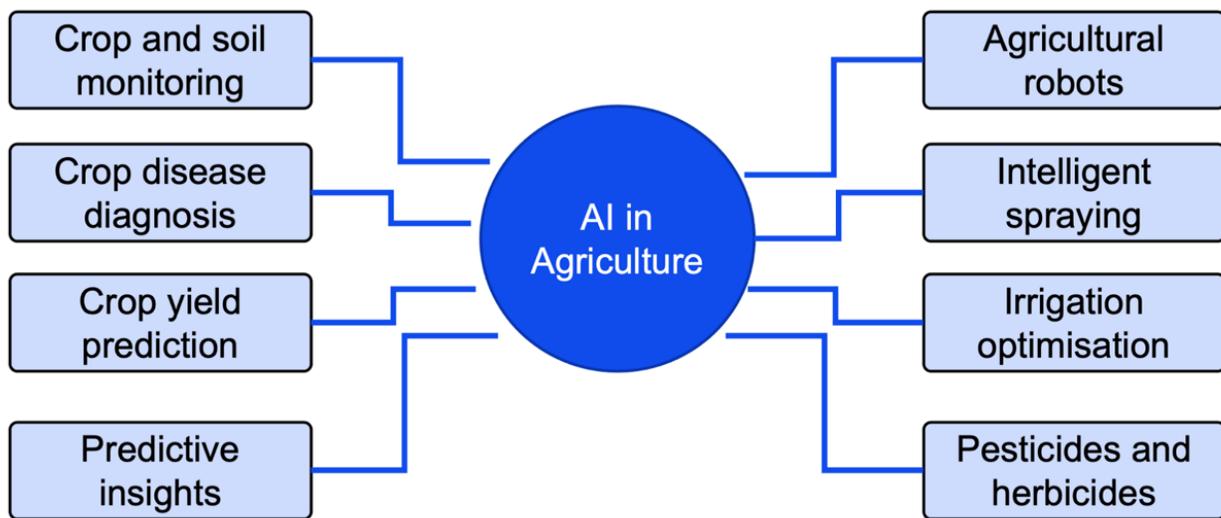
As such, food plays a crucial role nutritionally, emotionally, and in pleasure including smell, taste, and sight bringing joyful feelings. Properly balanced nutrition impacts the brain chemicals to begin a healthy change with quality performance and concentration in any aspect of the job or life activity. However, all the natural imagination and creativity of the artists above mentioned can be applied to new technology such as Artificial intelligence (AI) applications to agriculture, medicine, engineering, education, communication, and many other fields for a potential opportunity with the thoughtful and insightful application of AI. However, there is a debate among scientists about AI as a source argument regarding the tremendous social, ethical, and environmental impact of AI and robotics on humanity. As such, always attempt to learn new information and gain experience from shortcomings of past errors for the benefit of all life aspects, and improve and prevent not happening again, particularly in the Agri-food industry. Therefore, smart agriculture is a management concept that guides toward maximizing food production and food security, while minimizing risk to public health and environmental health under the challenges of environmental factors including changing climate for the opportunities to tackle with transparency for hoping toward all variables that play in the food chain.

**Understanding the Artificial Intelligence (AI):** Humanity is blessed with technological innovation if the user of this blessing AI innovation has been using it positively that does not cause harm to humans and the environment. Artificial Intelligence (AI) is a broad topic of discussion beyond the scope of this article. However, these recent intelligent computerized including Artificial Intelligence (AI) and Machine Learning (ML), perform human-like behavior, thinking abilities, and decision-making skills, involving tasks like learning, reasoning, problem-solving, perception, language comprehension, and related needs issues.

There are many ways to define Human Intelligence and Artificial Intelligence, to begin with, Human Intelligence can be defined as a form of power inside the human self, which influences someone's ability to gain knowledge and experiences in various fields. A noble human's brilliant brain is a noble creature of the Almighty God, and humans have the remarkable discovery of AI, therefore, Human Intelligence is the intellectual power of humans, which is marked by complex cognitive feats and high levels of motivation and self-awareness. Artificial Intelligence (AI), in simple terms, AI is a broad area of computer science that makes machines and computer programs capable of problem-solving and learning, like a human brain. Machine Learning ML, one of the most exciting areas of AI, involves the development of computational approaches to automatically make sense of data this technology leverages the insight that learning is a dynamic process, made possible through examples and experiences. For example, "Applied economics using machine learning techniques can be used to understand price fluctuations and risk management measures to numerous variables such as climate, government policies, and market demand (Choi et al., 2023)." Like a human, a computer machine can retain information and become updated over time. AI works by dealing with large amounts of data, extracting and interpreting patterns in that data, and translating these interpretations into action that should be often done by a human being, however, with the promise of AI to fulfill all the requirements of every aspect of humanity. In general, AI and machine learning techniques such as image processing, artificial neural network, deep learning, convolution neural network, fuzzy logic and computer vision with other techniques such as Wireless Sensor Network (WSN) technology, wireless communication, robotics, Internet of Things (IoT) all together will transform the way we interact with the world as reported by Jianlong Zhou and Fang Chen "Artificial Intelligence in Agriculture".

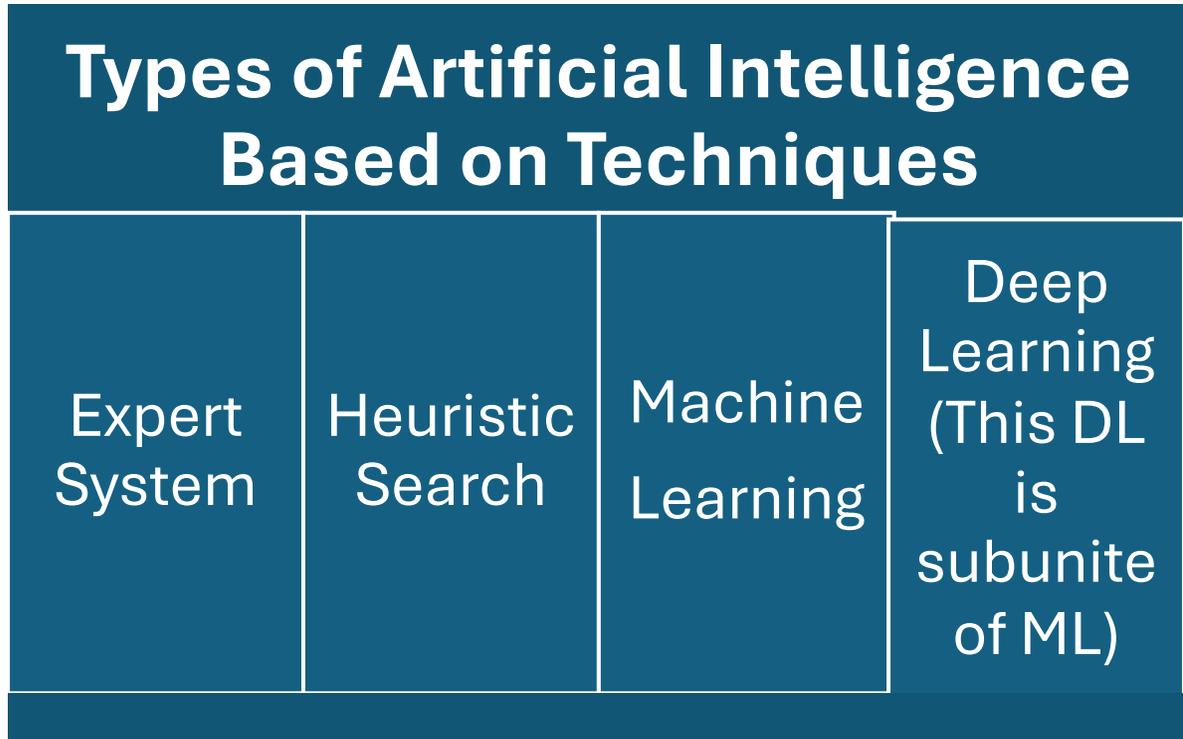
Furthermore, the report stated that AI enables the monitoring of climate change and natural disasters, enhances the management of public health and safety, helps doctors diagnose diseases more accurately, assists judges in making more consistent court decisions, enables employers to hire more suitable job candidates, automates the administration of government services, and promotes productivity for the economic well-being of the country. Additionally, computer scientists observed that efficient metaheuristic methods can be developed, based on the honeybee's intelligent cooperation behavior, allocating the task force and finding the food source using mutual interaction as guidance. However, the rest of this research study focuses on specific applications of AI in agriculture. **Challenges and Opportunities in Agriculture:** Humanity is facing various challenges that may impact the livelihood of many million people worldwide, particularly in developing countries. For example, the rapidly increasing world population that leads to more food demand, climate changes, drought, floods, insect and plant diseases, weed problems, vector-borne diseases, and urbanization will make the production of food more challenging in agriculture. **Why is Artificial Intelligence (AI) important to agriculture?** AI with its powerful technology capabilities provides vast amounts of data and interprets the data which can help increase farm efficiency by automating certain agriculture tasks including weather forecasting, planting, soil, weeding, irrigation, fertilizers, pesticide application, pest control (insect, disease), harvesting, processing, transporting, storing, etc., (below Fig).





Source: [https://opus.lib.uts.edu.au/bitstream/10453/173356/2/AI\\_Agriculture\\_Chapter.pdf](https://opus.lib.uts.edu.au/bitstream/10453/173356/2/AI_Agriculture_Chapter.pdf)

**Types of Artificial Intelligence Based on Techniques in Agriculture:**  
 To achieve the goal with AI computer software requires good knowledge using various techniques. It would be appropriate to discuss the different types of systems based on fundamental AI techniques: Expert Systems, Heuristic Search, Machine learning, and Deep learning.



Source: Credit: Daeun Choi, UF/IFAS

**What is the Expert System in Agriculture?** The expert system captured the knowledge and skills in the form of specific rules. (e.g., “if-then”). For example, assisting farm management support in irrigation scheduling based on soil moisture would be one of the advantages of the expert systems. “If the soil moisture level is below 41%, then turn on the water pump as reported by Choi et al., (Understanding Artificial Intelligence: What it is and how it is used in Agriculture 2023).

**What is Heuristic Search in Agriculture?** This type of search is to find an optimal solution for a problem (e.g., information is stored as a long string of Os and 1s). The AI algorithm searches for all possible combinations of these numbers to identify the best solution. Search for optimization systems for agriculture by planning and simulating all possible solutions. For example, determine the optimal number of harvesting machines needed for a certain field to minimize the total cost.

**What is Machine Learning in Agriculture?** Machine learning is an algorithm (The term “algorithm” is understood in association with computer computation. It was originally a mathematical term from the 8th century by Persian mathematician Muhammad ibn Musa al-Khwarizmi, also known simply as al-Khwarizmi) that imitates the human learning process (e.g., learning by example). Computer software can be exposed to curated and structured sample data repetitively (i.e., training process) to find general patterns using statistical and computational algorithms. For example, a crop price forecasting system technique can determine price fluctuations and risk management measures for various variables including climate change, government policies, and market demand.

**What is Deep Learning in Agriculture?** This is a subfield of ML, that uses a specific technique called Neural Networks to identify patterns in data. DL, adds more complexity to the traditional neural network to simulate how the human brain works, therefore, eliminating some of the data pre-processing involved with traditional machine learning. For example, a dynamic decision support system for autonomous driving of agricultural equipment. So far, it’s been mentioned about the types of AI based on different techniques. However, let us explore the subfield of AI applications.

**Types of Artificial Intelligence Applications in Agriculture:** There is a wide range of AI applications in many fields. However, here are focusing on the four most common AI subfields based on their applications in agriculture as follows:

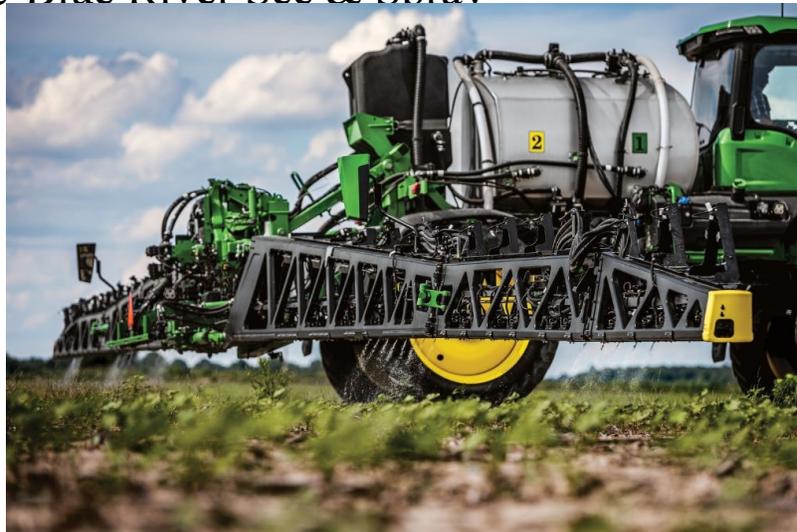
1. Computer vision
2. Natural language processing (NLP)
3. Robotics
4. Autonomous vehicles

It's important to understand for each subfield, any of the AI techniques mentioned earlier (expert system, heuristic search, machine learning, or deep learning) can be selected based on the need and complexity of tasks.

Types of Artificial Intelligence Applications in Agriculture			
Computer vision	Natural language processing	Robotics	Autonomous vehicle

Source: Credit: Daeun Choi, UF/IFAS

**Computer Vision (CV):** With tools of various types of cameras (color, near-infrared, multispectral, thermal, etc.) to observe the nearby environment by analyzing visual information using cameras. For example, weed recognition, plant, and crop detection, and land cover classification. See the commercial photo of John Deere-Blue River See & Spray™



Computer vision system for target spraying for weeds. The sprayer is equipped with 36 cameras and machine learning algorithms to detect weeds among corn, soybean, and cotton plants.



[Apple product diagram]. Overview of apple food products based on “apple (whole) food product”. Products have observable qualities and parts often as a result of the processes that transform them.

Source: Dooley et al., (FoodOn: a harmonized food ontology (the branch of metaphysics dealing with the nature of being) to increase global food traceability, quality control, and data integration 2018).

**Agricultural Robots and Automation:** Agricultural robots are advanced engineering focusing on performing multiple difficult jobs in agriculture production and management. Many companies are in the process of building and bringing it to market. For example, automatic harvesting robots pick specific types of fruit or vegetables based on their shape, size, or color. One of the concern issues of agricultural robots is to replace human labor as a result many people will be jobless.



Source: Automated harvesting concept. Image used courtesy of [Adobe Stock](https://control.com/industry-articles/outstanding-in-the-field-robots-that-can-pick-fruit/)  
<https://control.com/industry-articles/outstanding-in-the-field-robots-that-can-pick-fruit/>

**Autonomous Vehicles:** AI plays an important role in agricultural autonomous vehicles. For example, the environmental perception, and hardware control for autonomous electric tractors, ground vehicles, and drones.



John Deere's new 8R tractor series for fully autonomous driving and tillage. John Deere announced earlier in 2022 that they were preparing for large-scale production of the autonomous tractor. The 8R tractor uses six pairs of stereo vision (3D perception) and AI to navigate and plow the soil and sow seeds autonomously. Source: <https://edis.ifas.ufl.edu/publication/AE589> Credit: Wikimedia Commons

**AI and Irrigation Optimization:** Proper irrigation system and management is one of the crucially important resources for agriculture optimization. As such, AI technologies can provide multiple to monitor for making a smart decision. For example, the level of water, temperature of the soil, nutrient content, evapotranspiration model, and weather forecasting.

**Risks of AI in Agriculture:** without a doubt application and promise of AI for improving crop management and agricultural productivity, must consider the potential risks to ensure responsibility for ethical, social, and environmental safety. For example, unintended consequences, security against accidental failures, different location farm environments, and requirements to grow various crops. Speaking of risk many people think about is that AI will take over their job. Adoption of AI, as with other forms of information and computing technology, renders users vulnerable to hacking and other cyber-attacks by malicious actors, which must be counted as a risk in agriculture as elsewhere. Required perception training AI, because it's a new technology for farmers, would be time-consuming, tireless, and aware in developed countries, with much thoughtful application, especially in developing countries.

**Conclusion:** The brilliant human brain is a treasure of resources for creativity and innovation. Humanity is blessed with technological innovation if the user of this blessing innovation has been using it in agriculture productivity positively that does not cause harm to humans, animals, and the environment. Artificial Intelligence (AI) and Machine Learning (ML), perform human-like behavior, thinking abilities, and decision-making skills, involving tasks like learning, reasoning, problem-solving, perception, language comprehension, and related needs issues. AI is a new path in computer technology, Farmers need to be educated about AI, and it would be a challenge in developing countries. Further research is required with AI and ML and its ad adaptability to its applications.

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**Mission:** BioNatural Healing College is a non-profit public benefit institution that has tax-exempt status under the Internal Revenue Service, Section 501(c)(3) of the United States of America. Our goal is to offer a high-quality education a diploma program as well as holistic health and nutrition conferences, seminars, workshop, and continuing education. The focus of these educational programs is to offer healing and holistic nutrition science through online distance learning. These dynamic online education programs will provide diverse adult learners throughout the world the experience of enhancing their quality of life, their health, and their happiness.

**Vision:** The faculty, staff and management team of BioNatural Healing College are passionately committed to providing the best teaching possible in this field. We seek to encourage, motivate and explain the importance of this field to prospective students so that they may make an informed decision regarding enrollment. We seek an ultimate goal of satisfaction for the student based on responsibility, commitment, respect, awareness and sustainable education for society.

**Accreditation and Recognition:** BioNatural Healing College is based in California. It is an institution that has the goal to deliver on- demand online distance learning around the globe. This education is of high quality and vocational in nature. BioNatural Healing College is a legal business entity that has been approved to operate by the State of California's Bureau for Private Postsecondary Education that set forth in the educational code. BioNatural Healing College is not accredited by the United States Department of Education. BioNatural Healing College is a member of the American Holistic Health Association (AHHA).

