**ESSENCE OF INDIAN KNOWLEDGE TRADITION**

**UNIT –I**

**BASIC STRUCTURE OF INDIAN KNOWLEDGE SYSTEM:**

VEDA (AYURVEDA, DHANURVEDA, GANDHARVA VEDA, STHAPATYA AATI**(SHILPA VEDA**), ARTHA VEDA, VEEDANGA (SHIKSHA, KALPA, CHHANDA, NIRUKTHA, VYAKARANA, JYOTHISHYA) DARMA SHASTRA, MIMASHA, PURANA, TARKASHASTRA

**UNIT – II**

MODERN SCIENCE AND INDIAN KNOWLEDGE SYSTEM

YOGA HOLISTIC HEALTH CARE

**UNIT – III**

**INDIAN PHILOSOPHICAL TRADITION:**

A) ORTHODOX (HINDU) SCHOOL: SAMKYA, YOGA, NYAYA, VAISHESHIKA, PURVA MIMAMSA, VEDHANTA,

B) HETORODOX (NON-HINDU) SCHOOLS: CARVAKA, JAIN, BUDDHA

**UNIT-IV**

**INDIAN LINGUISTIC TRADITION:**

PHONOLOGY, MORPHOLOGY, SYNTAX AND SEMANTICS

**UNIT –V**

**INDIAN ARTISTIC TRADITION:**

CHITRA KALA, MANTRA KALA, VAASTU KALA, SANGEETHA KALA, NRUTHYU EVAM SAHITYAM

**UNIT – I**

**BASIC STRUCTURE OF INDIAN KNOWLEDGE SYSTEM**

The Vedas are considered the earliest literary record of Indo-Aryan civilization. It is the most sacred scriptures of India. They were meant to be mantras (incantations) in praise of various Aryan gods, it being the age when the Aryans were finding their feet in India. What they also reflect is a startlingly vivid picture of life. Vedas are the treasure troves containing spiritual knowledge encompassing all aspects of our life. Vedic literature with its philosophical maxims has stood the test of time and is the highest religious authority for all sections of Hindus in particular and for mankind in general.  
  
The word Veda means wisdom, knowledge or vision, and it is revered as the language of the gods in human speech. The essence of the Vedas is to regulate the social, legal, domestic and religious customs of the Hindus which is meticulously pursued to the present day. All the rituals of Hindus conducted upon birth, marriage, death etc. are based upon Vedic doctrines and they are being followed from time immemorial.

**PERIOD OF THE VEDAS:**

The Vedas are probably the earliest documents of the human mind. As the ancient Hindus seldom kept any historical record of their religious, literary and political realization it is indeed difficult to precisely say when the earliest portions of the Vedas came into existence and what is their period. Historians provide us many guesses but none of them is free from ambiguity. However it is believed that it is in 1200 B.C., when the first Aryan immigrants in India started composing the various hymns that are part of the books.   
  
The Rig Veda is said to be date back to 1500 B.C. - 1000 B.C. Some scholars date the Rig Veda as early as 12000 B.C. - 4000 B.C. The traditional date goes back to 3000BC, something which the German scholar Max Mueller accepted. Inspite of the controversy over the period of Rig Veda going on for long time, modern historians have now reached a consensus that its oldest parts were written around a 1200 B.C. The Sama Veda, Yajur Veda and Atharva Veda were compiled after the age of the Rig Veda and are ascribed to the Vedic period.

**THE FOUR VEDAS**

**The Rig Veda : (The Book of Mantra)** The Rig Veda is a collection of brilliant songs or hymns and is a main source of information in detail on the social, religious, political and economic background of the Rig-Vedic civilization. It is the oldest book in any Indo-European language and contains the earliest form of all Sanskrit mantras. Even though some of the hymns of Rig Veda characterize monotheism (belief in the existence of one god), naturalistic polytheism (belief in more than one god,) and monism (belief of different paths to the one god), in general, can be found in the hymns of Rig Veda. The Rig-Vedic 'samhita' (collection of mantras) consists of 1,017 'suktas' (hymns) divided into eight 'ashtakas' (songs) each having eight 'adhyayas' (sections), which are sub-divided into various groups with a total of about 10,600 stanzas. The hymns are collection of the work of many authors called 'rishis' (according to post Vedic tradition "seers"). Atri, Kanwa,Vashistha, Vishwamitra, Jamadagni, Gotama and Bharadwaja are considered as the seven primary seers.   
  
The hymns are devoted to thirty-three different gods, most of them nature gods like Indra (rain god), Agni (fire god), Rudra (storm god) etc. A sizeable chunk of the verses are also dedicated to Soma (air god).   
  
**The Sama Veda : (The Book of Chant)**

The Sama Veda is purely a collection of 'samans' (chants) derived from the eighth and ninth books of the 'original Veda', the Rig-Veda. The hymns in the Sama Veda, used as musical notes have no distinctive lessons of their own. Hence, its text is a reduced version of the Rig Veda. Vedic Scholar David Frawley says that if the Rig Veda is the word, Sama Veda is the song or the meaning, if Rig Veda is the knowledge, Sama Veda is its realization, if Rig Veda is the wife, the Sama Veda is her husband.   
  
Sama Veda was meant for the priests who performed the rituals of the soma ceremonies [rituals of the threefold realm of life & death (samsara)]. As time went on rituals and ceremonies of worship became increasingly complex and so a need arose to compile all the rituals and their chants in a book, as a sort of reference point for the priests. The emphasis was on the specific style of its poetry and its literary content had no relevance. There are also very strict instructions in SamaVeda as to how particular hymns must be sung. Great emphasis was put upon sounds of the words of the mantras so that they could have accomplished effects on the environment and the person who pronounced them.   
  
**The Yajur Veda : (The Book of Ritual)**

The Yajur-Veda or the wisdom of sacrifices is also a liturgical collection and was made to meet the demands of a ceremonial religion. It lays down various "yajurs" (sacred incantations) which were chanted by a particular sect of priests called adhvaryu. They performed the sacrificial rites. The Yajur Veda practically served as a guidebook for the priests who execute sacrificial acts and at the same time uttering the prayers and the sacrificial yajurs. Few hymns are also attributed to various Gods. However, the core of the Veda is dedicated to the theory of the rituals thereby making it very much ritual based. Many chants for the purpose of praying and paying respect to the various instruments that are involved in the sacrifices could also be seen the Veda. Not less than six complete recessions of Yajur Veda, viz. Madyandina, Kanva, Taittiriya, Kathaka, Maitrayani and Kapishthala are available now.   
  
**The Atharva Veda : (The Book of Spell)**

The Atharva-Veda (the wisdom of the Atharvans) is called so because the families of the atharvan sect of the Brahmins have traditionally been credited with the composition of the hymns of the Veda. This is the last of the four Vedas and is completely different from the other Vedas. It is considered next only to Rig-Veda with regard to history and sociology because its compilation of hymns lacks the remarkable spiritual experience that the Rig-Veda offers. Its hymns are of a more diverse nature than the Rig Veda and are also simpler in language and therefore it infuses a different experience. In fact, many scholars do not consider it part of the Vedas at all. The Atharva Veda consists of spells and charms prevalent at its time, and portrays a clearer picture of the Vedic society. It has incantations for everything, from success in love to the realization of otherworldly objectives.

**AUTHORS OF VEDAS**

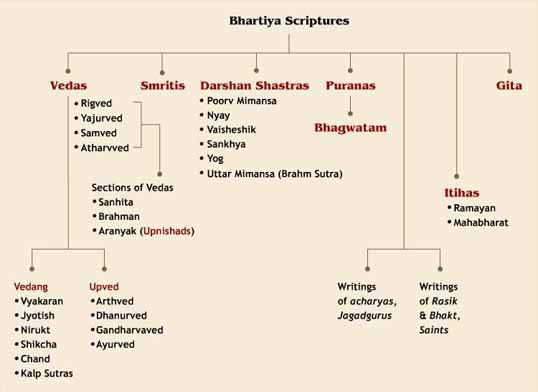
There is a strong belief among the Hindus that the revered compositions of the Vedas passed on through generations by the word of mouth from time immemorial and hence the general assumption is that the Vedic hymns were either taught by God to the sages or that they were revealed themselves to "mantradrasta" (seers). It is Vyasa Krishna Dwaipayana who was the key player in compiling the Vedas around the time of Lord Krishna (c. 1500 BC)

**DIFFERENT DIVISIONS OF VEDAS**

Each Veda consists of four parts:   
  
**The Samhitas (hymns):** A collection of mantras or hymns.   
  
**The Brahmanas (rituals):** The Brahmanas are ritualistic texts and include guidelines and religious duties. Each Veda has several Brahmanas attached to it.   
  
**The Aranyakas (theologies):** The Aryanyakas, meaning forest texts intend to serve as a guide of meditation for ascetics who live in forests and lead a lifestyle characterized by abstinence from various sorts of worldly pleasures often with the aim of pursuing religious and spiritual goals.   
  
**The Upanishads (philosophies):** The Upanishads form the concluding portions of the Veda and therefore called the "Vedanta" or the end of the Veda and contains the essence of Vedic teachings. The Upanishads along with the Aranyakas are the concluding portions of the Brahmanas, which discuss philosophical problems.

**CONCLUSION**

The Upanishads are a set of guidelines that pave way to attain brahma-knowledge through Vedanta. The different derivations together make out that they give us both spiritual vision and philosophical reasoning.The sages who discovered them wanted to go beyond nature in search of transcendental nature of man. They dared to take up this challenge and the Upanishads are the unique record of the methods they adopted, the struggles they undertook and the victory they achieved in this astonishing adventure of human spirit. In seeking the immortal, the sages conferred the immortality upon the literature they have passed on to us.   
  
One of the oldest and longest of the Upanishads, the Brihadaranyaka says: "From the unreal lead me to the real! From darkness lead me to light! From death lead me to immortality!"The crux of the Upanishads is that this can be achieved by meditating with the awareness that one's soul ('atman') is one with all things, and that 'one' is 'Brahman', which becomes the 'all'..



**The Upvedas:**

The Up-Vedas are the texts on the auxillary themes of the Vedas. The Upveda of RigVeda, YajurVeda, SamaVeda and Atharv Veda are Economics, Military Science, Music and Dance and Medical Sceinces respectively. There are 5 Upveda that can be traced in some meaningful form, they are as follows:-

**1. Ayurveda (Sciences relating to LIFE and MEDICINE):-**

Ayurveda is related to the secret of life and the science of long life. The originator of Ayurveda is supposed to be Lord Dhanwantari. Apart from him, other prominent names are Aitareya, Kashyapa, Harit, Agnivesha, and Bhedamuni. At present, three important books of Ayurveda are: Charak Samhita, Sushruta Samhita and Vaagbhatta Samhita. These three books are collectively called Brihat-trayi. Patanjali has also authored text on Ayurveda.

Ayurveda is a science that deals with ‘knowledge of life’ and longevity. The main texts of this life science are Sushruta Samhita and Charaka Samhita. Ayurveda deals with medicine and health. A long and healthy physical and mental life is necessary for a prolonged spiritual practice and experience. The source of this science, according to sage Sushruta (600 BeE), lies in the Atharva Veda which is aptly called Bhaishajya Veda (the Veda of medicine and treatment of diseases). Ayurveda includes methods of diagnoses and treatment for physiological and psychological illness. It deals with embryology, hygiene, anatomy, surgery, ere. Dominik Wujastyk, a Senior Research Fellow at the world- famous Wellcome Centre for the History of Medicine at the University College of London and the author of The Roots of Ayurveda, writes in his article ‘The Science of Medicine’, “Indian medicine, as a systematic and scholarly tradition, begins historically with the appearance of the great medical encyclopedias of Charaka, Sushruta and Bhela about two thousand years ago. Just as Panini’s famous linguistic study of Sanskrit leaps into the historical record fully formed, like the Buddha from Queen

Maya’s side, so the medical encyclopedias too emerge with a learned medical tradition in an almost fully articulated form.’ Obviously from this one can infer that medical science must have developed fully in ancient India before the emergence of the Sushruta Samhita and Charaka Samhita.

According to Ayurveda, the material bodies of human beings are composed of kala (protective layer), dhatu (component matter), mala (eliminations), three doshas (humours), agni (digestive fire) and kriya (movement or activity). Among these six the most important is the principle of three constitutional elements called humours in the human body, namely, vata (air), pitta (bile) and kapha (phlegm). Vata (air in body) includes all phenomena of motion and its essential components are ether and air. Kapha deals with cooling and preservation, and production of various secretions like mucus and cough. Its essential components are earth and ether. Pitta (bile) is made of fire and ether. It deals with metabolism, energy production, process of digestion, etc. A person may be constitutionally brisk (with vata dominating) or fiery (with pitta in dominance) or phlegmatic (with kapha being the prevalent element). But, according to Ayurveda, only when all three elements are in equilibrium in the human body a person is said to be healthy.

An ayurvedic doctor diagnoses a patient with reference to the relative levels of his or her vata, pitta and kapha. The ancient Indian rishis, Charaka and Sushruta, practised ayurveda and surgery respectively. Acharya Charaka (e.100 CE), who wrote the Char aka Sambita, is known as the ‘Father of Indian medicine’. Through his intuitive powers he had realized the medicinal qualities of 100,000 plants and herbs. Since the medications are herbal with least side-effects, they are becoming increasingly popular throughout the world. According to Charaka a long and healthy life is not possible if a person does not live morally. Morality gives rise to prajna or wisdom, which gives peace of mind and leads to longevity and happiness. When this prajna is abused, it causes all types of sickness. Acharya Sushruta (600 BCE) is popularly known as the ‘Father of Surgery in India’. In the Sushruta Samhita, a unique encyclopaedia of surgery, he details 300 types of operations he performed, along with 125 types of surgical instruments that he used. He is lauded as an early pioneer of plastic surgery and anaesthesia. Ayurvedic science is divided into eight major topics:

1. Shalya-rantra: surgery and midwifery

2. Shalakya-tantra: study of diseases of head, eyes, nose, throat, etc.

3. Kayachikitsa: therapeutics

4. Bhutavidya: mental diseases (psychiatry)

5. Kaurnarabhrurya-rantra : paediatrics and obstetrics

6. Agada-tantra: toxicology

7. Rasayana-tantra : remedies for venoms

Ayurveda also deals with the treatment of plants and animals. Texts of Ayurveda prescribe a strict code of conduct for the physician.

**Dhanurveda:**

This Upveda explains Spiritual sciences like PURUSHARTHA, DUTIES, DEEDS, etc and also Material sciences like CIVIL and MILITARY defense, war and politics. The Ramayana and Mahabharata a good deal of light is thrown upon this science and art, particularly in the descriptions of battles. The most ancient books of Dhanurveda are not available, but some of the known books are Dhanurvidhi, Drauna Vidya, Kodanda Mandana and Dhanurveda Samhita.

Dhanurveda is the science of archery, martial arts and weaponry. It is a military science, which is mentioned in the Rig Veda and Aitareya Brahmana. It is also known as shastravidya and it originates from the Yajur Veda. It deals with shastra and astra Shastra” means weapons which are used with one’s hands in war, such as swords and maces, and astra means weapons that are shot like arrows. Dhanurveda also deals with the manufacturing of and training with weapons. Although there is no ancient scientific work by the name of Dhanurveda, a text called Dhanurveda Sarnhira, belonging to a later period, is still extent.

**Gandharva Veda:**

Gandharvaveda is the science of music, derived from the Sama-Veda, and we have already dealt with this subject briefly, while dealing with the Vedaanga of Chhandas. Apart from Devotional Music it also deals with some subjects of Spiritual Sciences.

According to tradition gandharvas are expert musicians of swarga (the abode of the devas). It is believed that there used to be a work called Gandharvaveda with 30,000 verses on music, which is not available now. Gandharvaveda dealt with the science of music and the sacred performing arts. It derived its origin in the Sarna Veda. It included vocal and instrumental music, dance and drama. There are seven svaras (notes) from which ragas are produced, corresponding to the appropriate time of day and season. The ragas create astonishingly powerful physical, psychological and spiritual effects. While Western music has only two modes – major and minor scales – Indian music uses dozens of different modes. Bhararamuni’s Ndtyasbastra, available today, is an extraordinary text on music, dance and drama.

**Shilpa Veda (Sthapatyaveda or Vastushastra):**

It deals with architecture and various arts. According to Shukra-niti there are a number of arts but 64 are considered to be more prominent.

Some scholars consider Sthapatyaveda or Vastushastra as one of the Upavedas. It deals with the Hindu science of sacred architecture and the sthapati or architect. Traditionally, there are 18 teachers of architecture to whom Srhaptyaveda is ascribed. The two most well known among them are Vishvakarrna (the architect of the devas) and Maya (the architect of the asuras).

This important science has its origin in the Yajur Veda, wherein the sacrificial altar or yajna vedi was constructed with utmost precision and care in different geometrical patterns. Similarly, Hindu mandirs were built in different styles like Nagata, Dravida and Vesara with painstaking perfection by the master builders-cum-architects. It is remarkable that thousands of mandirs of ancient India, in locations as varied as mountains, caves and seashores, still stand today as majestic reminders of this ancient science. The continuing discovery of various sites of the Indus Valley civilization in the 20th and 21st century conclusively proves that India of remote antiquity had great architects and town planners.

Some of the ancient books on architecture include Abbilesbitsrtbacbintsmani, Brihatsamhita, Manasara, Sama- ranganasutradhara, and Mayamatashilpashastra. The A rthashastra of Kaurilya and some Puranas, like the Agni Purana, Matsya Purana and Padma Purana, also contain much information about architecture.

**Artha Veda:**

Artha-Veda is the Upaveda of the Atharva-Veda, which deals with social, economic, and political systems. In the early medieveal times Artha Shashtra was also authored by Chanakya.

In ancient India, Arthaveda meant the book contairung knowledge of material wealth and the means of acquiring it. The best available work of Arthaveda is the Arthashastra of Kautilya (c. 372 BCE). Kautilya was also known as Chanakya and Vishnugupta. He was the main adviser to King Chandragupta Maurya (340 BCE). Kautilya’s Arthashastra has its roots in the Atharva Veda. Shaunaka rishi, in his work Charanavyuha, lists Arthashastra as an Upaveda. This work has 6,000 shlokas that deal with 180 different topics like politics, law and economics. It is one of the most ancient and brilliant works in the world. In addition to economics it also covers such subjects as relations with enemy states, preparation of army for all types of combat, espionage system, and revenue collection, formation of the judiciary and discharging of justice.

**Vedang:**

Vedang are the auxillary to the four Vedas essential for the correct interpretation of the Vedas.

Mundaka Upanisad mentions that there are six Vedanga which are as follows: (i) Siksha (Education), (ii) Kalpa (Creation), (iii) Vyakarana (Grammer), (iv) Nirukta (Etymology), (v) Chhanda (Metres), and (vi) Jyotisha (Mathematics & Astronomy).

**1. Shikshaa: Science of Articulation and Pronunciation:-**

Siksha is related to sound, letters, pronunciation, the method of teaching and learning of these basic elements. Every Veda has its own peculiar pronunciation of certain letters, and each one of them has its specific modes and speed of recitation. A book called Siksha Sangraha contains a collection of 32 systems of siksha. These systems relate to different sakhas of the four Vedas. The most important among the books relating to siksha is the famous Paniniya Siksha. Another important book is Yaajnavalkya Siksha. In Vasishthi Siksha we have a detailed account of the differences between the mantras of the Rig-Veda and Yajur-Veda. Both Yaajnavalkya siksha and Vasishthi siksa are related to the Vajasaneyi Samhita. The other important works are: Katyaayani siksha, Paaraashari siksha, Maadhyandini Siksha, Keshavi Siksha and Manduki Siksha. In Naaradiya Siksha, which is related to the Sama-Veda, there is supposed to be the knowledge of the secret of different sounds.

The development of Siksha as a Vedaanga and as a science demonstrates the profoundity and vast scope of research that was undertaken in respect of pronunciation in ancient India. It is because of this Vedaanga that the system of Vedic recitation has remained intact right from the ancient times to the present day. A given sakha is recited in the same way all over the country, and Vedapaathis of the same sakha, belonging to different parts of India, pronounce mantras with the same intonation, speed and strength and force and even the same hand movements. If the Vedaanga system of pronunciation has remained so uniform in the country, and if the tradition has remained so powerful, it is because of the degree of perfection that was achieved in respect of Siksha.

**2. Kalpa (Creation):**

Vedic system involves Karmakaanda (system of prescribed acts and rituals). A detailed understanding of this Karmakaanda became necessary in due course of time, and this gave rise to a vast literature of Kalpasutra. Kalpa means that which is understood or justified in respect of prescribed acts and rituals.

**3. Pratishakhya / Vyaakaran / Grammer:-**

Vyakarana is considered to be a principal part of the six Vedaangas. Vyakarana is looked upon as the mouth among the Vedaangas. The most celebrated author of vyakarana is Panini, who has himself mentioned several great names of the great grammarians. Panini's famous book is Ashtadhyayi, in which he has discussed both Vedic and non-Vedic words.

One of the greatest commentaries on vyakarana is that of Patanjali. This is supposed to be the most authentic book on Panini's Vyakarana. The authenticity of Patanjali's commentary is so great that wherever there is a difference of opinion between Sutra, Vaarttika and Mahabhashya, the verdict of the Mahabhashya of Patanjali is regarded to be ultimately acceptable.

Closely connected with Siksha, Chhandas and Vyakarana, there is a body of literature known as Praatisaakhya. For each Veda and for each sakha there are certain specific rules, and these rules deal with various subjects connected with pronunciation, meters, and other grammatical matters. The meaning of the Veda is also indicated in the Praatisaakhya, and it is therefore considered to be an aid to the study of the concerned Veda. The Rik Praatisaakhya deals with the Saishiriya Upasaakha of the Saakala sakha of the Rig-Veda. Maharshi Shaunaka is the author. The great commentator Uvat has written a commentary on this Praatisaakhya.

Kaatyaayana who belonged to a period earlier than that of Panini composed Vajasaneyi Praatisaakhya. Uvat and Anantabhatta have written, respectively, Matriveda and Padaarthaprakashaka to elucidate the Praatisaakhya of Katyayana. Taittiriya Praatisaakhya is related to the Taittiriya Samhita of Krishna Yajur-Veda. The commentary has been written by Mahishi, which is known as Padakramasadana.

Pushpasutra and Riktantra are the two Praatisaakhyas on the Sama-Veda. The author of Pushpasutra is supposed to be Vararuchi, and the author of Riktantra is supposed to be Shaakatayaana.

The Chaturaadhyayika is the oldest Praatisaakhya of the Atharva-Veda. Kautsa is supposed to be the author of this Praatisaakhya, which is also known as Kautsa Vyakarana.

In sixteenth century AD, the method of the study of grammar propounded by Panini began to be replaced to some extent by the tradition of Kaatantra. In that tradition, Siddhanta Kaumudi of Bhattoji Dikshit and Prakriya Sarvasa of Narayana Bhatta are most prominent. Vyakarana developed also in the field of philosophy, and Bhartrihari who belonged to the sixth century AD initiated this.

**Nighantu / Nirukta (including Bhavprakash by Yashkaacharya):-**

Nirukta is a kind of commentary on Nighantu, which is a collection of difficult words of the Veda. Nighantu is supposed to have been one meaning, and in the fourth chapter, it gives a collection of those words, which have several meanings. In the fifth chapter, the names of Vedic gods have been collected. There have been many commentaries on Nighantu, but it is the commentary of Yaksha, which has found its place as one of the Vedaangas, and this Vedaanga is known as Nirukta. Nirukta is not confined only to meanings of words; it traces the words to their originals, and it indicates how different similar or dissimilar words arose from those origins. The principle that all names originated from verbs is an important principle of Nirukta, and even modern linguists accept this principle. Prior to Yaksha also, there were many methods and systems of Vedic interpretation, such as Aadhi-daivata, Aadhyaatma, Aakhyaana-Samaya, Aitihaasika, Naidaana, Paarivraaajaka, Yaajnika, etc.

**Chando Granth (prosody poetry):-**

The composition of the Vedas indicates consummate development of the knowledge of the poetic meter, chhandas. The first discussion on Vedic meters is to be found in the Saankhyaayana Srauta-sutra. But the classical work on meters is that of Maharshi Pingal. Meters or chhandas have been studied by Pingal in the eighth chapter of his book Chhandah-sutra. In this book, he has taken into account not only Vedic meters but also others. There are mainly seven Vedic meters, namely, Gayatri, Ushnik, Anushtubh, Brhati, Pankti, Trishtubh, and Jagati. According to Kaatyaayana, the highest number of mantras in the Rig-Veda is to be found in Trishtubh. This number is 4253. Gayatri has 24 67 mantras; Ushnik has 341 mantras; Pankti has 312 mantras, and Brahti has 181 mantras. Although there are numerous meters, we find only 50 meters in the Sanskrit literature.

Prior to Pingalacharya, there were several great teachers of Chhanda Sastra, such as Koshtuki, Yaksha, Kaashyapa and Maandavya. There have been several commentaries on the Chhanda-sutra of Pingalacharya. In fact, there has been a continuous development of books on Chhanda Sastra.

The development of musical science also owed a great deal to Chhanda Sastra. It is well known that the Sama-Veda is to sing. Although the method of singing the Sama is different from that of classical music, the seven tunes, namely, shadja, rishabha, gandhara, madhyama, panchama, dhaivata, and nishaada are used in Sama in the same way as in classical music. In the Chhaandogya Upanisad which is based upon the Sama-Veda, five types of musical renderings of the Sama have been indicated, namely, Himkaara, Prastaava, Udgitha, Pratihaar and Nidhaan. It is noteworthy that Vedic literature refers also to several musical instruments, including the veena. In social life, too, because of the close connection between religious rites and music, various melodies developed, particularly six melodies corresponding to the six seasons. Closely connected with music was the development of dance and drama. Among the important works in Sanskrit regarding music, dance and drama the most important one is Naatya Sastra of Bharat Muni. There are two Samhitas on Natya Sastra, namely, Dwaadasha Sahasri and Shat Sahasri. The traditions established by Bharat Muni remained prevalent for more than a thousand years, and even in the book Sangeet Ratnaakar or Sharangadeva of thirteenth century AD, the authority of Bharat Muni has been acknowledged. Thereafter also there has been a vast literature on music, dance and drama. In fact, music, dance, and drama received royal patronage throughout the ages, and some of the great kings of the north and south were themselves great musicians.

**Jyotish / Astronomy and Astrophysics:-**

The sixth Vedaanga relates to Jyotisa - astronomy and astrology. Jyotisa is considered to be the science of light, and it is looked upon as the eyes among the Vedaangas. Vedic knowledge had discovered an inner rhythm cosmic movement, and this rhythm seems to correspond with periodic developments and seasons of human life. The transit of planets, calculation of days and nights and the determination of various seasons were closely studied. The science of Jyotisa described planets, constellations, comets and also the rotations and revolutions of various luminous objects of the heavens.

Rig-Veda Jyotisa Vedaanga has been attributed to Lagadhaacharya. It consists of 36 verses. There is also a Jyotisa related to the Yajur-Veda and another related to Atharva-Veda. Yajur-Veda Jyotisa consists of 34 verses, and it has been attributed to Shoshaacharya. Atharva-Veda Jyotisa has 14 chapters and 102 verses. It is supposed to be a dialogue between Pitaamaha who was the speaker and Kashyapa who was the listener.

Among the greatest astronomers and astrologers of India, the most celebrated name is that of Varaahamihira. His famous book, Pancha Siddhaantika speaks of five systems of jyotisa: Pitamaha Siddhaanta, Vasistha Siddhaanta, Romaka Siddhaanta, Poulisha Siddhaanta, and Surya Siddhaanta. In due course, Jyotisa inspired the development of various sciences including arithmetic, algebra, geometry, astronomy, and astrology. Bhaskaraacharya of twelfth century AD is regarded as the first among the mathematicians and astrologers of the middle ages. Jyotisa is even today prevalent all over India, and it is even now a developing science. The Panchaanga, which gives detailed information regarding the tithi, vaara, nakshatra, yoga and karana, is commonly used in most Indian homes; and the annuals of the Panchaanga are constantly consulted by astronomers, astrologers and many individuals in day-to-day life.

**Dharmasastra:**

Dharmasastra is a genus of Sanskrit texts, and refers to the treatises (shastras) of Hinduism on Dharma. The Dharmashastras are the ancient law books of Hindus, which advocate moral laws and principles for devout duty and righteous conduct for the followers of the faith. They also shaped the guidelines for their social and religious code of conduct Hindus in the past where Hindu monarchs enforced the laws as part of their religious duty. However, looking to the heterogeneity and complex nature of Indian society from the earlier times, it is difficult to state how seriously these laws were imposed by the ruling classes among all sections of society. However, the Dharmashastras highlighted upon the social and religious conditions of ancient India, family life, gender and caste based distinctions, and principles of ancient jurisprudence. It can be find in them rudiments of many principles and practices of social and religious aspects of modern Hindu civilisation.

The Dharma Shastras, along with the Artha Shastras, are the codes of Hindu law, parallel to the Muslim Sharia, the Jewish Talmud, each of which provides guidelines for kings, ministers, judicial systems and law enforcement agencies. These spiritual-parliamentary codes differ from British and American law, which separate religion from politics. (Contemporary British law is influenced by Anglican Christian thought, just as American democracy was, and is, profoundly affected by the philosophy of its non-Christian, Deistic founders.) The Dharma Shastras also speak of much more, including creation, initiation, the stages of life, daily rites, duties of husband and wife, varnasrama, Vedic study, penances and transmigration.

All Dharmaśāstra derives its authority with reference to the Vedas, though few, if any, of the contents of most Dharmaśāstra texts can be directly linked with extant Vedic texts. Traditionally, Dharmaśāstra has, since the time of the Yājñvalkyasmṛti, been divided into three major topics: 1) ācāra, rules pertaining to daily rituals, life-cycle rites, and other duties of four castes or varṇas, 2) vyavahāra, rules pertaining to the procedures for resolving doubts about dharma and rules of substantive law categorized according the standard eighteen titles of Hindu law, and 3) prāyaścitta, rules about expiations and penances for violations of the rules of dharma.

**Mimansa :**

Mīmāṃsā ("investigation" (compare Greek ἱστορία), is the name of an astika school of Hindu philosophy whose primary enquiry is into the nature of dharma based on close hermeneutics of the Vedas

**man” = to think, consider, examine or investigate = “desire to think”. Mimamsa is divided into two systems**:

Purvamimamsa (“purva” = earlier ~ the earlier part of the Vedas) – an interpretation of the actions leading to freedom of the Soul. Also called Karma Mimamsa.

Uttarmimamsa (“uttara” = later ~ the later part of the Vedas) – an interpretation of the knowledge leading to freedom of the soul. Also called Jnana Mimamsa.

The basic premise of Mimamsa is that action is the very essence of human existence. Without action knowledge is fruitless, happiness is impossible and human destiny cannot be fulfilled. The purpose of Mimamsa is to inquire into the nature of Right Action (Dharma).

All actions are said to have two effects – external and internal. The external is gross, manifest and transitory. The internal is subtle and eternal. Actions are the vehicles for planting the seeds of life to come (aside: the word seed caused me to wonder if this relates to the idea of Vasana). In this light Mimamsa examines all the actions mentioned in the Vedas and offers a general summary of rules for the interpretation of Vedic texts.

Mimamsa accepts the philosophical concept of the other systems and does not enter any philosophical analysis of the nature of Reality, Soul & Matter or their relationships to one another. The sole concern of Mimamsa is salvation, not liberation. It argues that salvation cannot be achieved by knowledge alone, for the soul must first exhaust its potentialities through action (no amount of contemplation will enable man to arrive at the ultimate goal of human destiny). All arguments are based on the premises that the soul by definition must survive this earthly manifestation.

Mimamsa has a strong effect on the daily life of Hindu’s. All rituals and ceremonies depend on it, all moral conduct is guided by it; all Hindu law is founded upon it.

Mimamsa defined Dharma as “an object distinguished by a command”. “dhar” = to hold, maintain, preserve. When used in the metaphysical sense, it means those universal laws of Nature that sustain the operation of the universe and the manifestation of all things, that without which nothing could be. When applied to the individual, it has reference to that code of conduct that sustains the soul and enables man to fulfill his divine destiny.

All rituals and ceremonies in the Vedas are said to lead to the enlightenment of the mind and the spiritual evolution of the soul. On the surface they appear to be fruitless injunctions; therefore Mimamsa endeavors to show how they are all based on dharma and lead to the spiritual welfare of man.

Mimamsa claims that knowledge of dharma can only be attained by Verbal Testimony (Sabda) – every word has in an inherent power to convey its eternal meaning and teaching. There are a few refutes offered to the challenges made against this claim for example:

Claim: the word is a product of utterance therefore not eternal. Refute: the word must have existed previously otherwise it could not have been pronounced.

Claim: the word vanished after its pronounced. Refute: only the sound disappears, the word remains.

Claim: the word can be modified. Refute: changes of letters are not modifications, they are new words.

Mimamsa classifies the Vedas under five categories:

Vidhi – Injunctions (do’s)

Mantras - Hymns – texts which help to remember the procedures of rituals.

Namadheya – Names – which define matter.

Nisedha – Prohibitions (dont’s) that protect a man from doing things which may be injurious or disadvantageous to him.

Arthavada – Explanations – which praise Vidhi’s and blame Nisedha’s.

Mimamsa can be understood from the way it defends objections that are raised against Vedic mantras. For example:

Objection: Vedic mantras do not convey meanings because they stand in need of other passages to explain and support them. Defense: All Vedic words have significance just as they do in ordinary language.

Objection: Vedic mantras are held useless because they describe what does not exist. For example “It has four horns, it has three feet, two heads, it has seven hands; the bull being tied threefold, cries: the great god entered amongst the mortals”. Defense: this is figurative speech that use symbols.

Objection: Vedic mantras are held to be useless because they are learned without understanding their meaning. Defense: this is no fault of the Veda which deals only with the performance of sacrifices. It is assumed that meaning will be learned.

Objection: Vedic mantras are held to be useless because there are many mantras the meaning of which cannot be known. Defense: every mantra has a meaning. Our ignorance is due to careless and indolence.

**Purana:**

Purana, (Sanskrit: “Ancient”) in the sacred literature of Hinduism, any of a number of popular encyclopaedic collections of myth, legend, and genealogy, varying greatly as to date and origin.

Puranas were written almost entirely in narrative couplets, in much the same easy flowing style as the two great Sanskrit epic poems, the Mahabharata and the Ramayana. The early Puranas were probably compiled by upper-caste authors who appropriated popular beliefs and ideas from people of various castes. Later Puranas reveal evidence of vernacular influences and the infusion of local religious traditions.

Traditionally, a Purana is said to treat five subjects, or “five signs”: the primary creation of the universe, secondary creation after periodic annihilation, the genealogy of gods and patriarchs, the reigns of the Manus (the first humans), and the history of the solar and lunar dynasties. Creation and dissolution (sarga, “emission,” and samhara, “gathering in”) occur when Prajapati, a creator figure of the Vedic age, emits the universe and opens it, but everything is always in it, just alternately revealed (manifest) or concealed (latent); sarga lets it out, and samhara pulls it back in.

The Puranas also treat various topics concerning religious developments that occurred between about 400 and 1500 ce. Those additional topics include customs, ceremonies, sacrifices, festivals, caste duties, donations, the construction of temples and images, and places of pilgrimage. The genealogies of gods, Manus, and kings form an open-ended structure into which individual authors place whatever they wish to talk about (though some Puranas ignore the genealogies entirely). The questions of primary concern to those authors are how to live a pious life and how to worship the gods. Such worship includes the rituals (pujas) that should be performed at home, in the temple, and on special festival days; places to go on pilgrimage; prayers to recite; and stories to tell and listen to. Significantly, most of those rituals do not require the mediation of a Brahman priest.

There are traditionally 18 Puranas, but there are several different lists of the 18, as well as some lists of more or fewer than 18. The earliest Puranas, composed perhaps between 350 and 750 ce, are the Brahmanda, Devi, Kurma, Markandeya, Matsya, Vamana, Varaha, Vayu, and Vishnu. The next earliest, composed between 750 and 1000, are the Agni, Bhagavata, Bhavishya, Brahma, Brahmavaivarta, Devibhagavata, Garuda, Linga, Padma, Shiva, and Skanda. Finally, the most recent, composed between 1000 and 1500, are the Kalika, Kalki, Mahabhagavata, Naradiya, and Saura.

All the Puranas are strongly sectarian—some devoted to Shiva, some to Vishnu, and some to a goddess. But even those officially devoted to a particular god often pay considerable attention to other gods. By far the most popular Purana is the Bhagavata-purana, with its elegant treatment of the childhood and early life of Krishna. There are also 18 “lesser” Puranas, or upa-puranas, which treat similar material, and a large number of sthala-puranas (“local Puranas”) or mahatmyas (“magnifications”), which glorify temples or sacred places and are recited in the services at those temples.

**Tarka sastra:**

Tarka Sastra is a science of dialectics, logic and reasoning, and art of debate that analyzes the nature and source of knowledge and its validity. Sastra in Sanskrit means that which gives teaching, instruction or command. Tarka means debate or an argument. According to one reckoning, there are six sastras. Vyakarana is one of them. Four of the sastras are particularly important Vyakarana, Mimamsa, Tarka, and Vedanta.

The sastra has concepts called "poorva paksha" and "apara paksha". When one raises a point (poorva paksha) the other one criticizes it (apara paksha). Then the debate starts. Each one tries to support his point of view by getting various references. The meaning of the word tarka also is specific, in that it does not imply a pure logical analysis but a complex activity of discourse guided by strict definitions and goals so as to have. This concept is referred in Bhagawad Gita as "vadah pravadatAmasmi" (vibhooti yoga).

Tarkasamgraha which is the foundational text of logic and discourse was al the text followed as a Guidelines for discourses. Tarka may be translated as "hypothetical argument." Tarka is the process of questioning and cross-questioning that leads to a particular conclusion. It is a form of supposition that can be used as an aid to the attainment of valid knowledge.

There are several scholars well-versed in Tarka Sastras – Adi Shankara (788-820 CE), Ramanujacharya,Madhwacharya, Uddyotkar (Nyayavartik, 6th-7th century), Vācaspati Miśra (Tatparyatika, 9th century), Udayanacharya (Tatparyaparishuddhi, 10th century), Jayanta Bhatta (Nyayamanjari, 9th century), Vishwanath (Nyayasutravrtti, 17th century), and Radhamohan Goswami (Nyayasutravivaran, 18th century), Kumaran Asan. Paruthiyur Krishna Sastri and Sengalipuram Anantarama Dikshitar were specialized in Vyakarana, Mimamsa and Tarka Sastra. Also, Krishna Sastri excelled all those scholars of his contemporary period in Tarka Sastra.

**UNIT – II**

**MODERN SCIENCE AND INDIAN KNOWLEDGE SYSTEM**

**YOGA HOLISTIC HEALTH CARE**

**MODERN SCIENCE AND INDIAN KNOWLEDGE SYSTEM:**

We seldom realize the importance of what Einstein said

- We should be thankful to Indians who taught us how to count without which no worthwhile scientific discovery would have been possible.

We fail to recognize the magnitude of the famous British Historian Grant Duff’s words

- Many of the advances in the sciences that we consider today to have been made in Europe were in fact made in India centuries ago.

We ignore what the American Historian Will Durant said

- India was the motherland of our race and Sanskrit the mother of Europe’s languages. India was the mother of our philosophy, of much of our mathematics, of the ideals embodied in Christianity… of self-government and democracy. In many ways, Mother India is the mother of us all.

Most of us are not even aware of the historical facts which the famous French philosopher and writer Voltaire knew when he wrote

- It is very important to note that some 2,500 years ago at the least Pythagoras went from Samos to the Ganges to learn geometry…But he would certainly not have undertaken such a strange journey had the reputation of the Brahmins’ science not been long established in Europe

Sanskrit is the sine qua non of ancient Indian knowledge systems. It is the key for the treasure house of ancient Indian wisdom. Sanskrit itself is one of the earliest inventions of ancient scientific pursuits in the human world. In a so organized manner the physiognomic origin of speech sounds was well depic ted in the ancient Indian texts on Sanskrit language even in Pre - Paninian Times.The earliest traces of the concept of social living are well documented in Sanskrit.Since then Sanskrit has, through several millennia,been growing as the binding force of all the people of this Sub - Continent. From Kargil to Kanya Kumari and from Kamarupa to Saurastra, the whole India is one for every Indian because of his possessiveness for Sanskrit. The geographical descriptions available in ancient Sanskrit texts describe India as a single whole and never view it partly. This lofty idea of ‘One Nation – One people’ with regard to our country is as old as the Vedic tradition.

In the anatomic analysis of the linguistic body of India all the regional languages play the efficient role of various limbs. Each of the limbs should be strong, good and well structured enough for a healthy body. So also all the regional languages, which are the striking marks of Indian diversity, are strengt hening the country from all sides. At the same time as the heart does purify the blood and pumps to all the limbs for their proper and efficient functioning Sanskrit supplies all the phonetic, morphological, semantic and syntactical elements and even the common and technical vocabulary to all the Indian languages irrespective of their Indo - European or Dravidian origin. This unifying nature of Sanskrit earned it a unique place among all the languages of our country. The sovereignty of linguistic India could be protected through Sanskrit and surely not through any other regional language.

One who systematically learns Sanskrit with commitment will imbibe all the noble qualities like Ahimsa (Non Violence), Karuna (Compassion) and aitri(Friendliness). These assimilated qualities will ensure one to have an incomparable personality with an exemplary individuality. Right from the Vedic times the Indian intellectuals are after the pursuit of establishing harmonious relation between the man and the Nature. They always advocate the mother and son relationship between the Nature and the man. The trees, the streams, the hill and dale, the sky and the earth, the oceans and rivers and every other thing in nature from pebble to peninsul ar is very much lively, divine and dynamic for our ancestors of Sanskrit culture. As all the western languages are indebted to Greek, the spring fountain of the western scientific terminology, so are all the Indian regional languages even today owe much to Sanskrit to coin new scientific terms in India. So it is very much essential for every scientist and expert of technology to learn Sanskrit as a language and also as a source of many scientific disciplines of knowledge to prepare subject wise glossaries of universal acceptance in the country to spread the science and technology to the thresholds of all Indian villages in their regional languages.

Every country, while importing the foreign stocks of scientific and technological knowledge, never disowns its own ancestral - indige nous knowledge in the respective fields. But in India we disown our intellectual wealth and cling to a parasitic approach to import or dump western technology which those countries have left some decades back. Always we have been lagging behind even while adapting the western content.

**Sastra and Science are synonymous:-**

Here a little comparison may help to assess or evaluate the worth of our ancient Indian knowledge systems. Observation, hypothesis, experimentation, forming the principles through deduction and induction are if the essentials of science, the Sastras or various disciplines of knowledge in Sanskrit too possess the same essentials in the name of three means of acquiring knowledge viz. Pratyaksha (Direct Perception can otherwise be called Observation), Anumana (The process of hypothesis, deduction and induction methods of logic) and Sabda (Verbal testimony) which preserves all the principles of predecessors in text form. So the term Sastra can synonymously be used with the term ‘science’. Scientific method was as old as the human thought in this land of letters. Vedic literature was its main spring. Vedic seers were the first generation scientists. They adopted the method of observation, experimentation and deduction to produce the reliable phenomenal expatiation of various face ts of knowledge. In this pioneering task they took the instrumental assistance too of a high technical value. Besides the three dimensions observation, experimentation and deduction the seers took the help of the fourth dimension intuition in producing such volumes of scientific literature.

Hence our ancient seers advanced a set of means of Knowledge to say in other words the essentials for acquiring knowledge correspondingly representing the basic constituents of science in the following manner.

**Means of Knowledge Corresponding constituents of**

**Modern Science**

1. Pratyaksha or Direct Perception - Observation

2. Direct Perception - Experimentation

3. Anumana or Inference - Deduction or Induction

4. Sabda or Verbal Testimony

and Yogaja Pratyaksha

(The intuitive perception) - Extra Sensual Perception

**The Two Fold Streams of Sastras and the Big Data of Indian Knowledge:-**

All the Disciplines of Ancient Indian knowledge are divided into two treams as Injunctive Sciences and Mundane sciences adapting the methods of expansion of data, compression of data and encryption of data. While the Injunctive Sciences (The Vedas) regulate the human behavioral traits the Mundane sciences deal with the nature, scope and purpose of natural and physical world for the comfortable living of mankind. As a result the following disciplines through several millennia have been descended down to the modern world from the lineage of seers of India.

The huge volumes of Veda Samhitas, Brahmanas, Aranyakas, Upanishads, Srauta/Grhya/Sulba Sutra Texts, Shadangas, Anukramanika Texts, Pratisakhyas, 500 Smriti Texts, Six Orthodox Systems of Philosophy, Two Itihasas – The Ramayana and The Mahabharata, 18 Puranas, Texts on 64 Fine Arts, Agama Texts dealing with standard architectural techniques, Specialized Lexicons (Kosa granthas) and Various Sastra Texts dealing with the living crafts of human societ are even today name wise and title wise are available. In these huge volumes of treatises lot of information is available pertaining to the modern areas of study such as Astronomy, Acoustics, Agriculture, Architecture, Botany (with rich etymological notes on thousands of herbal plants), Mathematics (with its branches of Arithmetic, Algebra, Trigonometry, Spherical Trigonometry, Binomial Theorem, Geometry) , Metallurgy, Hydrology, Medicine, Physiological Phonetics,Articulatory Phonetics, Meteorology, Seismology, Dietetics, Mineralogy, Geology,Environmental Science, Cosmetics, Chemistry, Physics, Animal Husbandry, Zoology,Cosmology, Psychology, Parapsychology, Moralogy and Management Studies. All these knowledge sections can assure the modern world to lead a pollution free long life for hundred and plus years. In the pursuit of tracing out the scientific contents in Sanskrit one has to first have an introduction to various literary types of existing in this perennial language.To broadly introduce the following are the major branches of various disciplines of knowledge available in Sanskrit. They are -When compared to the modern scientific fields the contents of those ancient texts are of three types as knowledge areas which have no modern parallels, knowledge areas which have equal modern parallels and knowledge are as which seem lower to the available modern areas of similar kind.

**Branches of Sciences found in Sanskrit:-**

An observation helps to understand that the following branches of science are traceable in ancient Sanskrit literature.

**Physical and Chemical Sciences:-**

Nyaya and Vaiseshika systems give the earliest reference to the atoms of air,fire,water and earth. Nyaya Darsana gives some information about preparing lenses.Manusmriti, Matsya Purana, Ayurvedic and Rasatantra texts present the details of mensuration. Rasatantra Texts give an abundant information of various metals,chemicals and chemical processing. An interesting information of constructing a chemistry laboratory is available in all the famousRasatantra Granthas.

**Natural Sciences:-**

The texts like Susruta Samhita, Amara kosa and Nirukta recorded the Indian system of Botanical Taxonomy. Susruta Samhita, Rgveda and Atharva Veda and various Pauranic Texts give a good amount of information with regard to the Medical Botany. In the texts on Vastu, some texts on Vrkshayurveda and some epic sources present a detailed account of Agriculture and Gardening methods. There is a reference to the sense perception of plants in the Mahabharata. The Ramayana, Smritis and some Vedic texts give vivid picture of the classification of the animals and make a deep study of their structure and the methods of curing diseases of different animals.

**Indian Mathematics:-**

Similarly in the field of Mathematics the process of counting numbers from one to Parartha in ten multiples is mentioned in Krshna Yajurveda, Ramayana, Brahmanda Purana and other texts. Lilavati is the text on Algebra. Suryasiddhanta deals with Trigonometry. Sulba Sutras of Apstambha and others present a detailed study of Geometry for the purpose of structuring Sacrificial Altars. Halayudha’s commentary on Pingala’s Chandas furnishes a good in formation of Binary Arithmetic.

**Earth and Space Sciences:-**

Likewise in the text Brhat Samhita of Varahamihira we have a bulk of information with regard to the process of finding out underwater currents. Nearly two hundred methods are presented which can even today be put in practice. Seismology is another interesting subject available in the Brhat Samhita of Varahamihira. Brahma Siddhanta, Vasistha Siddnata,Surya Siddhanta, Paulisa Siddhanta and Romaka Siddhanta are the five famous Astronomical Works with wonderful content pertaining to the Planets, their positions, moments and their influence over the earth.Texts like amarangana Sutradhara, Maya Vastu etc., stand as a concrete proof for the masterly knowledge of our ancient people in the field of Architecture.

**BRANCHES OF SANSKRIT SCIENCE:**

**Physics and Chemical Sciences Natural Sciences:**

\* Nyaya and Vaiseshika Darsanas

\* Manusmriti

\* Matsya Purana

\* Ayrvedic Texts

\* Rasatantra Texts

**Natural Sciences:**

\* Botany (Indian Taxonomy)

\* Medical Botany- Amarakosa

\* Agriculture – Krishi Parasara

\* Zoology – Smritis and Kosas

\* Indian Medicine – Ayurveda

**Indian Mathematics**

\* Counting - Krshna Yajurveda, Epics & Puranas

\* Algebra - Lilavati

\* Trigonometry - Suryasiddhanta

\* Geometry - Sulbasutras of Apastambha etc.

\* Binary Arithmetic - Halayudha’s Commentary on Pingala’s Chandas

**Earth and Space Sciences**

\* Geology - Brhat Samhita etc.

\* Gemology - Ayurvedic Texts and Puranas, Rasa Tantras

\* Seismology - Brhat Samhita etc.

\* Astronomy - The Five Siddhantas

\* Architecture - Samarangana

**Humanities**

\* Behavioral Sciences

\* State Craft

\* Human Management

\* Trade & Commerce

\* The art of Making Ornaments

**Fivefold sources of Scientific Literature in Sanskrit:**

All the above sources of various disciplines of ancient Indian Knowledge systems are fivefold as: Vedic Literature, Pauranic Literature, Independent Treatises related to the said modern areas, Inter-disciplinary References and Classical Sanskrit Literature. Here is a set of illustrations related to Mathematics and Botany from the said five sources. For the rest of the branches also one can develop material from all these five streams.

|  |  |  |  |
| --- | --- | --- | --- |
| **S.NO** | **SOURCE WORKS** | **MATHEMATICS** | **BOTANY** |
| **1** | Vedic Literature | Krshna Yjurveda  Atharva Veda  Satapatha Brahmana  Sulba Sutras | Rigveda  Taittiriya Samhita  Atharva Veda  Nirukta |
| **2** | Independent Treatises | Lilavathi | Vrukshayurveda  Sarangadhara Paddhati |
| **3** | Puranas and Itihasas | Ramayana, Mahabharata | Ramayana  Mahabharata  Agnipurana  Garudapurana  Matsya Purana |
| **4** | Kavya literature | Saundarya Lahari | Works of Bhasa,  Kalidasa  Bana and others |
| **5** | References in the Other disciplines | Pingala Chandas  Sangita Ratnakara  Vedanga Jyotisha  Other Astronomical works | Manusmriti  Ayurveda  Vastu  Amarakosa  Arthasastra  Jyotisha |
|  |  |  |  |
|  |  |  |  |

If the process of learning all these branches of knowledge and arts is revived and introduced in a novel way suitable to the modern times and to meet needs of our contemporary times it will be of high advantage and the pride of our nation also can be well protected.

**Significant Science and Tech Discoveries Ancient India Gave the World:**

One of the oldest civilizations in the world, the Indian civilization has a strong tradition of science and technology. Ancient India was a land of sages and seers as well as a land of scholars and scientists. Research has shown that from making the best steel in the world to teaching the world to count, India was actively contributing to the field of science and technology centuries long before modern laboratories were set up. Many theories and techniques discovered by the ancient Indians have created and strengthened the fundamentals of modern science and technology. While some of these groundbreaking contributions have been acknowledged, some are still unknown to most.

**1. The Idea of Zero:**

Little needs to be written about the mathematical digit ‘zero’, one of the most important inventions of all time. Mathematician Aryabhata was the first person to create a symbol for zero and it was through his efforts that mathematical operations like addition and subtraction started using the digit, zero. The concept of zero and its integration into the place-value system also enabled one to write numbers, no matter how large, by using only ten symbols.

**2. The Decimal System**

India gave the ingenious method of expressing all numbers by means of ten symbols – the decimal system. In this system, each symbol received a value of position as well as an absolute value. Due to the simplicity of the decimal notation, which facilitated calculation, this system made the uses of arithmetic in practical inventions much faster and easier.

**3. Numeral Notations**

Indians, as early as 500 BCE, had devised a system of different symbols for every number from one to nine. This notation system was adopted by the Arabs who called it the hind numerals. Centuries later, this notation system was adopted by the western world who called them the Arabic numerals as it reached them through the Arab traders.

**4. Fibbonacci Numbers**

The Fibonacci numbers and their sequence first appear in Indian mathematics as mātrāmeru, mentioned by Pingala in connection with the Sanskrit tradition of prosody. Later on, the methods for the formation of these numbers were given by mathematicians Virahanka, Gopala and Hemacandra , much before the Italian mathematician Fibonacci introduced the fascinating sequence to Western European mathematics.

**5. Binary Numbers**

Binary numbers is the basic language in which computer programs are written. Binary basically refers to a set of two numbers, 1 and 0, the combinations of which are called bits and bytes. The binary number system was first described by the Vedic scholar Pingala, in his book Chandahśāstra, which is the earliest known Sanskrit treatise on prosody ( the study of poetic metres and verse).

**6. Chakravala method of Algorithms**

The chakravala method is a cyclic algorithm to solve indeterminate quadratic equations, including the Pell’s equation. This method for obtaining integer solutions was developed by Brahmagupta, one of the well known mathematicians of the 7th century CE. Another mathematician, Jayadeva later generalized this method for a wider range of equations, which was further refined by Bhāskara II in his Bijaganita treatise.

**7. Ruler Measurements**

Excavations at Harappans sites have yielded rulers or linear measures made from ivory and shell. Marked out in minute subdivisions with amazing accuracy, the calibrations correspond closely with the hasta increments of 1 3/8 inches, traditionally used in the ancient architecture of South India. Ancient bricks found at the excavation sites have dimensions that correspond to the units on these rulers.

**8. A Theory of Atom**

One of the notable scientists of the ancient India was Kanad who is said to have devised the atomic theory centuries before John Dalton was born. He speculated the existence of anu or a small indestructible particles, much like an atom. He also stated that anu can have two states — absolute rest and a state of motion. He further held that atoms of same substance combined with each other in a specific and synchronized manner to produce dvyanuka (diatomic molecules) and tryanuka (triatomic molecules).

**9. The Heliocentric Theory**

Mathematicians of ancient India often applied their mathematical knowledge to make accurate astronomical predictions. The most significant among them was Aryabhatta whose book, Aryabhatiya, represented the pinnacle of astronomical knowledge at the time. He correctly propounded that the Earth is round, rotates on its own axis and revolves around the Sun i.e the heliocentric theory. He also made predictions about the solar and lunar eclipses, duration of the day as well as the distance between the Earth and the Moon.

**10. Wootz Steel**

A pioneering steel alloy matrix developed in India, Wootz steel is a crucible steel characterized by a pattern of bands that was known in the ancient world by many different names such as Ukku, Hindwani and Seric Iron. This steel was used to make the famed Damascus swords of yore that could cleave a free-falling silk scarf or a block of wood with the same ease. Produced by the Tamils of the Chera Dynasty, the finest steel of the ancient world was made by heating black magnetite ore in the presence of carbon in a sealed clay crucible kept inside a charcoal furnace.

**11. Smelting of Zinc**

India was the first to smelt zinc by the distillation process, an advanced technique derived from a long experience of ancient alchemy. The ancient Persians had also attempted to reduce zinc oxide in an open furnace but had failed. Zawar in the Tiri valley of Rajasthan is the world’s first known ancient zinc smelting site. The distillation technique of zinc production goes back to the 12th Century AD and is an important contribution of India to the world of science.

**12. Seamless Metal Globe**

Considered one of the most remarkable feats in metallurgy, the first seamless celestial globe was made in Kashmir by Ali Kashmiri ibn Luqman in the reign of the Emperor Akbar. In a major feat in metallurgy, Mughal metallurgists pioneered the method of lost-wax casting to make twenty other globe masterpieces in the reign of the Mughal Empire. Before these globes were rediscovered in the 1980s, modern metallurgists believed that it was technically impossible to produce metal globes without any seams, even with modern technology.

**13. Plastic Surgery**

Written by Sushruta in 6th Century BC, Sushruta Samhita is considered to be one of the most comprehensive textbooks on ancient surgery. The text mentions various illnesses, plants, preparations and cures along with complex techniques of plastic surgery. The Sushruta Samhita ’s most well-known contribution to plastic surgery is the reconstruction of the nose, known also as rhinoplasty.

**14. Cataract Surgery**

The first cataract surgery is said to have been performed by the ancient Indian physician Sushruta, way back in 6th century BCE. To remove the cataract from the eyes, he used a curved needle, Jabamukhi Salaka, to loosen the lens and push the cataract out of the field of vision. The eye would then be bandaged for a few days till it healed completely. Sushruta’s surgical works were later translated to Arabic language and through the Arabs, his works were introduced to the West.

**15. Ayurveda**

Long before the birth of Hippocrates, Charaka authored a foundational text, Charakasamhita, on the ancient science of Ayurveda. Referred to as the Father of Indian Medicine, Charaka was was the first physician to present the concept of digestion, metabolism and immunity in his book. Charaka’s ancient manual on preventive medicine remained a standard work on the subject for two millennia and was translated into many foreign languages, including Arabic and Latin.

**16. Iron-Cased Rockets**

The first iron-cased rockets were developed in the 1780s by Tipu Sultan of Mysore who successfully used these rockets against the larger forces of the British East India Company during the Anglo-Mysore Wars. He crafted long iron tubes, filled them with gunpowder and fastened them to bamboo poles to create the predecessor of the modern rocket. With a range of about 2 km, these rockets were the best in the world at that time and caused as much fear and confusion as damage. Due to them, the British suffered one of their worst ever defeats in India at the hands of Tipu.

**Yoga for holistic health care:**

Yoga for Holistic Health The word Yoga means “to join” or “to merge”. The concept of Yoga is to merge the Soul of the practitioner to the Eternal Soul by using certain sets of social, physical and mental rituals and regimens. Yoga has been practiced for thousands of years in India and has risen in popularity around the globe recently. Today most people identify Yoga only with Asna, the physical practice of Yoga but there are other tools of which are: Conscious breathing (Pranayama), Meditation (Dhaarna),Life-style and dietary changes (Yama and Niyama) and Visualization (Dhayaana) etc. These tools address all dimensions of human system, body, breath, mind, personality and emotions. Yoga has many parts, one of the most important among them is Astanga Yoga, which as name suggests comprises of eight parts namely- Yama, Niyama, Asna, Pranayama, Pratyahaar, Dhaarna, Dhyaan and Samadhi. Astanga Yoga provides complete sets of rituals and practices which helps attaining the complete state of health. In the present era of globalization and industrialization various aspects of health like spiritual, social and mental health are being ignored for materialistic benefits which has a huge impact on Physical health also and this urbanization leads to ill behaviors like hatred, violence and social disharmony which are not good for the self as well as for the socialism. Now as per the definition of health by WHO: “Health is a state of complete physical, mental, social and spiritual wellbeing of a person and not merely the absence of disease.” Among the eight parts of Astanga Yoga- Yama and Niyama are used for attaining perfect personal hygiene, social health and social harmony thus preventing communicable diseases, nonsocial behaviors. Asna and Pranayama are used to attain proper physical strength and wellbeing. Pratyahaar being the bridge between the extrinsic and intrinsic Yoga. Dhaarna, Dhayaan and Samadhi are the steps to attain full spiritual and mental wellbeing but are hard to achieve. Thus role of Yoga (Astanga Yoga) in holistic health achievement is very much clear and it can be used as a powerful tool in preventing the communicable, psychosomatic and physical diseases as the ancient proverb says: “Prevention is always better than cure.”

**Ashtanga Yoga of Patanjali -an Art and Science of Holistic Health and Wellbeing**

Ashtanga Yoga of Maharshi Patanjali is a classical work on Yoga philosophy. The Yoga sutras of the sage provide the comprehensive understanding on the principles and practices of the subject with its scientific background. The discussion on human psychology and its interactions on our body are meticulously explained along with the solutions to be applied for the experience of the life filled with happiness, health and joy in abundance.

The concept of holistic health and wellbeing is achieved through Ashtanga Yoga using its science, technique and philosophy. This structured Curriculum of Classical Yoga in India has significantly contributed the guidelines for the health and lifestyle.

Sadhana Pada or the study of eight limbs is an important tool for practitioner or Yoga teacher to climb the ladder of the highest step in Yogic path. This section of the study will enhance the ability of the Yoga practitioner in all the dimensions of his personality such as physical, mental, emotional and moral levels in order to culminate in the spiritual journey.

**What are these eights limbs of Yoga?**

Patanjala Yoga Sutra II.29 describes the list of eight limbs as follows Yoga Sutras. Ashta means eight and Anga means limbs, these are

1. Yama

2. Niyama

3. Asana

4. Pranayama

5. Pratyhahara

6. Dharana

7. Dhayna

8. Samadhi

1. **Yama - Code of Conduct:**

Yama is the practice of Social code of conduct. These values are helpful to maintain the harmony in the society with an individual. They harness the principles of live and let live for the sustainable eco friendly environment in the society using the concepts of sharing and caring. The collective practice of these principles in Yoga regularizes the behavior and personality free from moral impurities. There are five such disciplines, they are -

a. Ahimsa - Non Violence

b. Satya - Truth fullness

c. Asteya- Non Stealing

d. Brahmacahrya - Continence

e. Aparigraha - Non possessiveness

**2. Niyama - Personal Observances**

Niyama is the second lesson which is of personal observances. These practices are important to enhance the quality of our willpower, intellect and emotions. This yogic discipline is foundation for the removal of emotional impurities which are stemming from mental toxins such as the feelings of hatred and jealousy. Yama and Niyama together form the structural basis for the ethical preparation which is an essence of every Yoga Teacher Training Course. They contribute for the mental peace through the purification of our senses, mind and body. The five personal observances are,

a. Saucha -Cleanliness

b. Santosha - Contentment

c. Tapas -Austerity

d. Swadhyaya -Self study

e. Ishwar pranidhana - Devotion

**3. Asana-body Posture - A Practice for the disciplining the body:**

Asana is stable and comfortable body posture. The Practice of Asana brings the steadiness, feeling of lightness and well being. The regular practice of yoga postures develops the best possible physical and mental health. It overcomes the dualities of the mind and body. It is a remedy for the removal of the obstacles such as physical illness. Removal of physical impurities takes place through the poses. They contribute for the homeostasis which is a state of balance in the psycho-physiological, neuro muscular as well as endocrinal mechanisms. There are various therapeutical benefits of Asana for the different systems of our body. It is an important preparation for the practices of pranayama and meditation too. Classical texts on Hatha yoga training syllabus explain the various types of Asana like cultural, meditative and Relaxative poses.

**4. Pranayama - Regulation of the Vital force**

Upon the successful practice of Asana, The Pranayama Practice is undertaken. This practice is useful in the regulation of the vital force. The breath and mind have strong relationships; the stability of the mind is the result of the stability of the breath. It is a process of the purification of the nadis- the subtle energy channels in our systems. The energetic anatomy and physiology of the human body is influenced through these techniques to the greater extent. The blockage in the energy channels dissipates the pranic energy leading to imbalances which result in mental sickness and physical sufferings in the form of abnormal conditions. Different types of Pranayama practices bring the calmness to the mind, develops the qualification for the mental concentration.

**5. Prathyahara - Regulation of the senses.**

Prathyahara is the practice of disciplining the senses; this technique establishes the perfection in the mastery for the sense control .Serenity of the mind is possible when our sense organs are under control. Techniques like Yoga Nidra, Inner silence are very good for the training of the senses. The practice helps to eliminate the source of the disturbance by disassociating the sensory inputs to the sense organs from their corresponding objects.

**6. Dharana**

Dharana - Concentration

The practice of concentration is fixing the mind on the object of meditation. This practice reduces the fluctuations of the mental modifications. It is the result of the first five limbs of practices which are called as bahiranga Yoga. The concentration leads the attainment of meditation.

**7. Dhayna**

Dhayna - Meditation

The Practice of Meditation is an unbroken flow of the awareness on the chosen object of contemplation. The physiology of the meditation impacts the entire aspects of our personality from the gross to the subtle experience. This technique harmonizes the physical, mental and emotional experiences to enjoy the state of holistic health and feeling of wellbeing.

**8. Samadhi - The absolute absorption with supreme**

This is the highest state of Yoga Sadhana. It is an experience of the bliss in the core of our being. The progressive approach on concentration and meditation gets culminated in this supreme state of Yoga

**Holistic Health Benefits of Yoga:**

**Physical Health:**

**1. Flexibility:** The most obvious health benefit of yoga is flexibility. By gently stretching and holding poses, your [ligaments and tendons](https://www.aurawellnesscenter.com/2012/06/01/teaching-yoga-asanas-runners/) elongate, and you gain greater range of motion throughout your body.

**2. Balance:** Tree pose and Half-Moon are examples of postures that increase balance and confidence. These poses will decrease the likelihood of sustaining injury by falling. Balance poses also increase your strength and coordination.

**3. Digestive and Organ Health:** Poses like Seated Twist and Cat pose gently massage organs and increase blood flow. This results in detoxification, better circulation and increased energy. Good organ health is vital in the prevention of disease.

**Mental Health**

**4. Memory:** By engaging in postures, breathing exercises and meditations, you learn to [keep your mind clear](https://www.aurawellnesscenter.com/2012/02/04/benefits-of-yoga-nidra/) for longer periods. This dramatically improves concentration and focus. Yoga also increases blood flow to the brain.

**5. Stress Reduction:** A major benefit of yoga is stress reduction. Stress is a leading cause of physical and mental dysfunction. Stress is the trigger mechanism for many health conditions, pains, and aches. Yoga incorporates controlled breathing, called pranayama, into the practice. By learning these powerful techniques, you can actually tackle a stressful situation at the onset, by just taking a moment to breathe.

**Spiritual Health**

**6. Awareness:** When you begin to practice yoga, you build self-awareness. You find you are no longer sleepwalking through life, but feel connected to yourself and others. This empowers you to make better decisions and be more compassionate.

**7. Peacefulness:** The practice of chanting and meditation, in combination with yoga, will enhance your ability to be in the moment. Learning this skill calms the mind and creates a peaceful, satisfied state of being.

If you are looking to make positive changes, you will find that a regular yoga practice can be beneficial to most any aspect of your life. Yoga can [bring you more happiness](https://www.aurawellnesscenter.com/2012/02/22/practicing-yoga-for-happiness/), productivity, creativity, and energy. It can improve your posture, your digestion, your relationships, and your overall health. It just makes perfect sense to get on the mat, and begin your journey to your very best self.

**UNIT – III**

**INDIAN PHILOSOPHICAL TRADITION**

A) **ORTHODOX (HINDU) SCHOOL:** SAMKYA, YOGA, NYAYA, VAISHESHIKA, PURVA MIMAMSA, VEDHANTA

B) **HETORODOX (NON-HINDU) SCHOOLS:** CARVAKA, JAIN, BUDDHA

**Introduction:**

Indian Philosophy India has a rich and diverse philosophical tradition dating back to the composition of the Upanishads in the later Vedic period. According to Radhakrishnan, the oldest of these constitute " the earliest philosophical compositions of the world." Indian philosophy, the systems of thought and reflection that were developed by the civilizations of the Indian subcontinent. They include both orthodox (astika) systems, namely, the Nyaya, Vaisheshika, Samkhya, Yoga, Purva-Mimamsa (or Mimamsa), and Vedanta schools of philosophy, and unorthodox (nastika) systems, such as Buddhism and Jainism. Indian thought has been concerned with various philosophical problems, significant among which are the nature of the world (cosmology), the nature of reality (metaphysics), logic, the nature of knowledge (epistemology), ethics, and the philosophy of religion.

Since the late medieval age (ca.1000-1500) various schools (Skt: Darshanas) of Indian philosophy are identified as orthodox (Skt: astika) or non-orthodox (Skt: nastika) depending on whether they regard the Veda as an infallible source of knowledge. There are six schools of orthodox Hindu philosophy and three heterodox schools. The orthodox are Nyaya, Vaisesika, Samkhya, Yoga, Purva mimamsa and Vedanta. The Heterodox are Jain, Buddhist and materialist (Cārvāka). However, Vidyāraṇya classifies Indian philosophy into sixteen schools where he includes schools belonging to Saiva and Raseśvara thought with others.

The main schools of Indian philosophy were formalised chiefly between 1000 BC to the early centuries AD. Subsequent centuries produced commentaries and reformulations continuing up to as late as the 20th century by Aurobindo and Prabhupada among others. Competition and integration between the various schools was intense during their formative years, especially between 800 BC to 200 AD. Some like the Jain, Buddhist, Shaiva and Advaita schools survived, while others like Samkhya and Ajivika did not, either being assimilated or going extinct. The Sanskrit term for "philosopher" is dārśanika, one who is familiar with the systems of philosophy, or darśanas.

**Significance of Indian philosophies in the history of philosophy:**

In relation to Western philosophical thought, Indian philosophy offers both surprising points of affinity and illuminating differences. The differences highlight certain fundamentally new questions that the Indian philosophers asked. The similarities reveal that, even when philosophers in India and the West were grappling with the same problems and sometimes even suggesting similar theories, Indian thinkers were advancing novel formulations and argumentations. Problems that the Indian philosophers raised for consideration, but that their Western counterparts never did, include such matters as the origin (utpatti) and apprehension (jnapti) of truth (pramanya). Problems that the Indian philosophers for the most part ignored but that helped shape Western philosophy include the question of whether knowledge arises from experience or from reason and distinctions such as that between analytic and synthetic judgments or between contingent and necessary truths. Indian thought, therefore, provides the historian of Western philosophy with a point of view that may supplement that gained from Western thought. A study of Indian thought, then, reveals certain inadequacies of Western philosophical thought and makes clear that some concepts and distinctions may not be as inevitable as they may otherwise seem. In a similar manner, knowledge of Western thought gained by Indian philosophers has also been advantageous to them.

Vedic hymns, Hindu scriptures dating from the 2nd millennium bce, are the oldest extant record from India of the process by which the human mind makes its gods and of the deep psychological processes of mythmaking leading to profound cosmological concepts. The Upanishads (speculative philosophical texts) contain one of the first conceptions of a universal, all-pervading, spiritual reality leading to a radical monism (absolute nondualism, or the essential unity of matter and spirit). The Upanishads also contain early speculations by Indian philosophers about nature, life, mind, and the human body, not to speak of ethics and social philosophy. The classical, or orthodox, systems (darshanas) debate, sometimes with penetrating insight and often with a degree of repetition that can become tiresome to some, such matters as the status of the finite individual; the distinction as well as the relation between the body, mind, and the self; the nature of knowledge and the types of valid knowledge; the nature and origin of truth; the types of entities that may be said to exist; the relation of realism to idealism; the problem of whether universals or relations are basic; and the very important problem of moksha, or liberation (literally ―release‖)—its nature and the paths leading up to it.

**Common themes:**

The Indian thinkers of antiquity (very much like those of the Hellenistic schools) viewed philosophy as a practical necessity that needed to be cultivated in order to understand how life can best be led. It became a custom for Indian writers to explain at the beginning of philosophical works how it serves human ends (puruṣārtha). Recent scholarship has shown that there was a great deal of intercourse between Greek and Indian philosophy during the era of Hellenistic expansion.

Indian philosophy is distinctive in its application of analytical rigour to metaphysical problems and goes into very precise detail about the nature of reality, the structure and function of the human psyche and how the relationship between the two have important implications for human salvation (moksha). Rishis centred philosophy on an assumption that there is a unitary underlying order (RTA) in the universe which is all pervasive and omniscient. The efforts by various schools were concentrated on explaining this order and the metaphysical entity at its source (Brahman). The concept of natural law (Dharma) provided a basis for understanding questions of how life on earth should be lived. The sages urged humans to discern this order and to live their lives in accordance with it.

**Schools**

**Hindu philosophy**

**Orthodox (Himdu) School: Samkhya, Yoga, Nyaya, Vaisheshika, Purva Mimansa, Vedantha:**

Many Hindu intellectual traditions were classified during the medieval period of BrahmanicSanskritic scholasticism into a standard list of six orthodox (astika) schools (darshanas), the "Six Philosophies" (ṣad-darśana), all of which accept the testimony of the Vedas.

Samkhya, the enumeration school

• Yoga, the school of Patanjali (which provisionally asserts the metaphysics of Samkhya)

• Nyaya, the school of logic

• Vaisheshika, the atomist school

• Purva Mimamsa (or simply Mimamsa), the tradition of Vedic exegesis, with emphasis on Vedic ritual, and

• Vedanta (also called Uttara Mimamsa), the Upanishadic tradition, with emphasis on Vedic philosophy.

These are often coupled into three groups for both historical and conceptual reasons: NyayaVaishesika, Samkhya-Yoga, and Mimamsa-Vedanta. The Vedanta school is further divided into six sub-schools: Advaita (monism/nondualism), also includes the concept of Ajativada, Visishtadvaita (monism of the qualified whole), Dvaita (dualism), Dvaitadvaita (dualismnondualism), Suddhadvaita, and Achintya Bheda Abheda schools.

Besides these schools Mādhava Vidyāraṇya also includes the following of the aforementioned theistic philosophies based on the Agamas and Tantras:

Pasupata, school of Shaivism by Nakulisa

• Saiva, the theistic Sankhya school

• Pratyabhijña, the recognitive school

• Raseśvara, the mercurial school

• Pāṇini Darśana, the grammarian school (which clarifies the theory of Sphoṭa)

The main Hindu orthodox (astika) schools of Indian philosophy are those codified during the medieval period of Brahmanic-Sanskritic scholasticism, and they take the ancient Vedas (the oldest sacred texts of Hinduism) as their source and scriptural authority:

**Samkhya:**

Samkhya is the oldest of the orthodox philosophical systems, and it postulates that everything in reality stems from purusha (self or soul or mind) and prakriti (matter, creative agency, energy). It is a dualist philosophy, although between the self and matter rather than between mind and body as in the Western dualist tradition, and liberation occurs with the realization that the soul and the dispositions of matter (steadiness, activity and dullness) are different.

**Yoga:**

The Yoga school, as expounded by Patanjali in his 2nd Century B.C. Yoga Sutras, accepts the Samkhya psychology and metaphysics, but is more theistic, with the addition of a divine entity to Samkhya's twenty-five elements of reality. The relatively brief Yoga Sutras are divided into eight ashtanga (limbs), reminiscent of Buddhism's Noble Eightfold Path, the goal being to quiet one's mind and achieve kaivalya (solitariness or detachment).

**Nyaya:**

The Nyaya school is based on the Nyaya Sutras, written by Aksapada Gautama in the 2nd Century B.C. Its methodology is based on a system of logic that has subsequently been adopted by the majority of the Indian schools, in much the same way as Aristotelian logic has influenced Western philosophy. Its followers believe that obtaining valid knowledge (the four sources of which are perception, inference, comparison and testimony) is the only way to gain release from suffering. Nyaya developed several criteria by which the knowledge thus obtained was to be considered valid or invalid (equivalent in some ways to Western analytic philosophy).

**Vaisheshika:**

The Vaisheshika school was founded by Kanada in the 6th Century B.C., and it is atomist and pluralist in nature. The basis of the school's philosophy is that all objects in the physical universe are reducible to a finite number of atoms, and Brahman is regarded as the fundamental force that causes consciousness in these atoms. The Vaisheshika and Nyaya schools eventually merged because of their closely related metaphysical theories (although Vaisheshika only accepted perception and inference as sources of valid knowledge).

**Purva Mimamsa:**

The main objective of the Purva Mimamsa school is to interpret and establish the authority of the Vedas. It requires unquestionable faith in the Vedas and the regular performance of the Vedic fire-sacrifices to sustain all the activity of the universe. Although in general the Mimamsa accept the logical and philosophical teachings of the other schools, they insist that salvation can only be attained by acting in accordance with the prescriptions of the Vedas. The school later shifted its views and began to teach the doctrines of Brahman and freedom, allowing for the release or escape of the soul from its constraints through enlightened activity.

**Vedanta:**

The Vedanta, or Uttara Mimamsa, school concentrates on the philosophical teachings of the Upanishads (mystic or spiritual contemplations within the Vedas), rather than the Brahmanas (instructions for ritual and sacrifice). The Vedanta focus on meditation, self-discipline and spiritual connectivity, more than traditional ritualism. Due to the rather cryptic and poetic nature of the Vedanta sutras, the school separated into six sub-schools, each interpreting the texts in its own way and producing its own series of sub-commentaries: Advaita (the best-known, which holds that the soul and Brahman are one and the same), Visishtadvaita (which teaches that the Supreme Being has a definite form, name - Vishnu - and attributes), Dvaita (which espouses a belief in three separate realities: Vishnu, and eternal soul and matter), Dvaitadvaita (which holds that Brahman exists independently, while soul and matter are dependent), Shuddhadvaita (which believes that Krishna is the absolute form of Brahman) and Acintya Bheda Abheda (which combines monism and dualism by stating that the soul is both distinct and non-distinct from Krishna, or God).

**HETORODOX (NON-HINDU) SCHOOLS: CARVAKA, JAIN, BUDDHA:**

There are schools that do not accept the authority of the Vedas are categorised by Brahmins as unorthodox (nastika) systems. Chief among the latter category are Buddhism, Jainism and Cārvāka.

**Jain philosophy:**

Jainism came into formal being after Mahavira synthesised philosophies and promulgations of the ancient Sramana philosophy, during the period around 550 BC, in the region that is present day Bihar in northern India. This period marked an ideological renaissance, in which the Vedic dominance was challenged by various groups like Jainism and Buddhism.

A Jain is a follower of Jinas, spiritual 'victors' (Jina is Sanskrit for 'victor'), human beings who have rediscovered the dharma, become fully liberated and taught the spiritual path for the benefit of beings. Jains follow the teachings of 24 special Jinas who are known as Tirthankars ('fordbuilders'). The 24th and most recent Tirthankar, Lord Mahavira, lived in c.6th century BC, in a period of Cultural Revolution all over the world. During this period, Socrates was born in Greece, Zoroaster in Iran, Lao Tse and Confucious in China and Mahavira and Buddha in India. The 23rd Thirthankar of Jains, Lord Parsvanatha is recognised now as a historical person, lived during 872 to 772 BC... Jaina tradition is unanimous in making Rishabha, as the First Tirthankar.

Jainism is not considered as a part of the Vedic Religion (Hinduism). Even as there is constitutional ambiguity over its status. Jain tirthankars find exclusive mention in the Vedas and the Hindu epics. During the Vedantic age, India had two broad philosophical streams of thought: The Shramana philosophical schools, represented by Buddhism, Jainism, and the long defunct and Ajivika on one hand, and the Brahmana/Vedantic/Puranic schools represented by Vedanta, Vaishnava and other movements on the other. Both streams are known to have mutually influenced each other.

The Hindu scholar Lokmanya Tilak credited Jainism with influencing Hinduism in the area of the cessation of animal sacrifice in Vedic rituals. Bal Gangadhar Tilak has described Jainism as the originator of Ahimsa and wrote in a letter printed in Bombay Samachar, Mumbai: 10 Dec 1904: "In ancient times, innumerable animals were butchered in sacrifices. Evidence in support of this is found in various poetic compositions such as the Meghaduta. But the credit for the disappearance of this terrible massacre from the Brahminical religion goes to Jainism." Swami Vivekananda also credited Jainsim as one of the influencing forces behind the Indian culture.

One of the main characteristics of Jain belief is the emphasis on the immediate consequences of one's physical and mental behavior. Because Jains believe that everything is in some sense alive with many living beings possessing a soul, great care and awareness is required in going about one's business in the world. Jainism is a religious tradition in which all life is considered to be worthy of respect and Jain teaching emphasizes this equality of all life advocating the non harming of even the smallest creatures. Non-violence (Ahimsa) is the basis of right View, the condition of right Knowledge and the kernel of right Conduct in Jainism.

Jainism encourages spiritual independence (in the sense of relying on and cultivating one's own personal wisdom) and self-control (vratae) which is considered vital for one's spiritual development. The goal, as with other Indian religions, is moksha which in Jainism is realization of the soul's true nature, a condition of omniscience (Kevala Jnana). Anekantavada is one of the principles of Jainism positing that reality is perceived differently from different points of view, and that no single point of view is completely true. Jain doctrine states that only Kevalis, those who have infinite knowledge, can know the true answer, and that all others would only know a part of the answer. Anekantavada is related to the Western philosophical doctrine of Subjectivism.

**Buddhist philosophy:**

Buddhist philosophy is a system of beliefs based on the teachings of Siddhartha Gautama, a prince later known as the Buddha, or "awakened one". From its inception, Buddhism has had a strong philosophical component. Buddhism is founded on the rejection of certain orthodox Hindu philosophical concepts. The Buddha criticized all concepts of metaphysical being and non-being as misleading views caused by reification, and this critique is inextricable from the founding of Buddhism.

Buddhism shares many philosophical views with other Indian systems, such as belief in karma, a cause-and-effect relationship between all that has been done and all that will be done. Events that occur are held to be the direct result of previous events. A major departure from Hindu and Jain philosophy is the Buddhist rejection of a permanent, self-existent soul (atman) in favor of anatta (non-Self) and anicca (impermanence).

Jain thinkers rejected this view, opining that if no continuing soul could be accepted then even the effort to attain any worldly objective would be useless, as the individual acting and the one receiving the consequences would be different. Therefore, the conviction in individuals that the doer is also the reaper of consequences establishes the existence of a continuing soul.

**Cārvāka philosophy:**

Cārvāka or Lokāyata was a philosophy of skepticism and materialism, founded in the Mauryan period. They were extremely critical of other schools of philosophy of the time. Cārvāka deemed Vedas to be tainted by the three faults of untruth, self-contradiction, and tautology. And in contrast to Buddhists and Jains, they mocked the concept of liberation, reincarnation and accumulation of merit or demerit through the performance of certain actions. They believed that, the viewpoint of relinquishing pleasure to avoid pain was the "reasoning of fools". Cārvāka thought consciousness was an emanation from the body and it ended with the destruction of the body. They used quotes from Brihadaranyaka Upanishad to support this claim. Cārvāka denied inference as a means of knowledge and held sensory indulgence as the final objective of life.

Cārvāka held the view that Invariable Concomitance (vyapti), a theory of Indian logic which refers to the relation between middle term and major term freed from all conditions, could not be ascertained. However, Buddhists refuted this view by proposing that Invariable Concomitance was easily cognizable from the relation between cause and effect or from the establishment of identity.

Modern Indian philosophy was developed during British occupation (1750–1947). The philosophers in this era gave contemporary meaning to traditional philosophy. Some of them were Bal Gangadhar Tilak, Bankim Chandra Chattopadhyay, Raja Ram Mohan Roy, Sri Aurobindo, Kireet Joshi, Mahapandit Rahul Sankrityayan, Debiprasad Chattopadhyay, M. N. Roy, Indra Sen, Haridas Chaudhuri, Swami Sahajanand Saraswati, Ananda Coomaraswamy, Ramana Maharshi, and Sarvepalli Radhakrishnan.

Among contemporary Indian philosophers, Osho and J. Krishnamurti developed their own schools of thought. Pandurang Shastri Athavale, U. G. Krishnamurti and Krishnananda are other prominent names in contemporary Indian philosophy.

**Political philosophy:**

The Arthashastra, attributed to the Mauryan minister Chanakya, is one of the early Indian texts devoted to political philosophy. It is dated to 4th century BCE and discusses ideas of statecraft and economic policy.

The political philosophy most closely associated with India is the one of ahimsa (non-violence) and Satyagraha, popularised by Mahatma Gandhi during the Indian struggle for independence. It was influenced by the Indian Dharmic philosophy, particularly the Bhagvata Gita, as well as secular writings of authors such as Leo Tolstoy, Henry David Thoreau and John Ruskin. In turn it influenced the later movements for independence and civil rights, especially those led by Martin Luther King, Jr. and to a lesser extent Nelson Mandela.