Minor Degree

in

Indian Knowledge System (IKS)
Minor Degree in Indian Knowledge System (IKS)

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AICTE has been making this effort for value-education and value-based education for value-based living since 2017. For this it has already placed in its Model Curriculum two mandatory culture inputs:

- Mandatory 3-week Student Induction Program for all newly joined students, which includes IKS-I: Introduction to Indian Culture and Civilization (with some present practices)
- IKS-II: Indian Culture and Civilisation with its Knowledge Systems and Traditions (a non-credit mandatory course for all students during 2nd semester)

In response to NEP 2020, AICTE has decided to additionally offer a minor degree in UHV

- **Minor Degree in IKS can be given for students who have completed the minimum credit requirement of 18 credits in IKS courses**
- The credits of the mandatory IKS courses (IKS-I and IKS-II) are to be counted in calculating the total IKS course credits
- The IKS courses mentioned in this document are to be offered as Open Electives

Following Open Electives/ Streamed Electives (Minors) in Indian Knowledge System are envisaged for the Minor Degree in IKS:
1. IKS III  Vision for a Human Society (Vishva Kalyan thru Vasudhaiva Kutumbkam)
2. IKS IV Indian Science, Engineering and Technology- Past, Present & Future
3. IKS V Indian Town Planning and Architecture
4. IKS VI Indian Mathematics and Astronomy
5. IKS VII Indian Aesthetics (including Music & Musical Instruments)/ Arthashastra
6. IKS VIII Indian Health, Wellness and Psychology- including Ayurved

Faculty Preparation

These courses may initially be offered by the HSS department, but there is a need to have a separate multi-disciplinary IKS Cell to offer these IKS courses. This cell should be composed of faculty from all teaching departments, who take responsibility to teach these courses. Of course, faculty to mentor the students and to teach the various IKS courses have to be appropriately prepared.

These courses will be available in MOOC / other online or self-learning format for the time being.
Other Possible elective (minor) courses in IKS -

Indian System of Proof and Logic (including Nyay Shastra)
Indian Linguistics and Phoenetics (including Panini’s grammar, languages)
Indian Governance, Administration and Management Systems (including Arthshastra)
Indian Physics (e.g. Vaisheshik)
Textile Industry in India
Shipbuilding and Maritime Trade
Transport Systems in India
Principles and practice of Mechanics and Machines
Water Management in India
Ecology and Geography in India
Natural Agriculture and horticulture (e.g. vriksha ayurved) Practices in India
Indian Economics (Arthshastra)

Essential Preparation for each Course
Teaching-Learning Material
Syllabus*
PPT*
Video Recording of Lectures (MOOCs preferred) *
Text Book(s)*
Practice Exercises
Faculty Development Program(s)*
Prepared Faculty
Follow-up for further development of faculty
Internship and Research opportunities
Committed team for all of the above*

* Minimum preparation requirements
INDIAN KNOWLEDGE SYSTEM

AICTE Model Curriculum for Open Elective/Streamed Elective as Minor Degree for Undergraduate degree courses
List of IKS Courses (Mandatory, Open and Elective for Minor Degree) in IKS

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<th>Mandatory Courses in UHV</th>
<th>Suggested Semester</th>
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<tr>
<td>1. IKS-I: Indian Knowledge System-I – Introduction</td>
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<td>2. IKS-II: Indian Knowledge System-II</td>
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<th>Open Electives/ Streamed Electives for Minor in UHV</th>
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<td>1. IKS III: Vision of Human Society</td>
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<td><em>(Vishva Kalyan thru Vasudhaiva Kutumbkam)</em></td>
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<td>2. IKS IV: Indian Science, Engineering &amp; Technology</td>
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<td><em>(Past, Present &amp; Future)</em></td>
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<td>3. IKS V: Indian Town Planning &amp; Architecture</td>
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<td>4. IKS VI: Indian Mathematics &amp; Astronomy</td>
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<td>5. IKS VII: Indian Aesthetics (including Music &amp; Music Instruments)/Arthashastra</td>
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<td>6. IKS VIII: Indian Health, Wellness and Psychology- including Ayurved</td>
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*The detailed materials for the marked courses are in the process of development, therefore, the provision for these courses can be made and they can be offered when materials are ready (within 1 year, i.e., by July 2022, the time when the course IKS-III will be offered in 3rd Semester).

The syllabus for courses being offered is given below:
IKS-I: Indian Knowledge Systems and Traditions

Syllabus

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Course Objectives

- To sensitize the students about context in which they are embeded i.e. Indian culture and civilisation including its Knowledge System and Tradition.
- To help student to understand the knowledge, art and creative practices, skills and values in ancient Indian system.
- To help to study the enriched scientific Indian heritage.
- To introduce the contribution from Ancient Indian system & tradition to modern science & Technology

Detailed contents:  

[ Total Theory Duration : 28 Lectures]

Module 1: Introduction to IKS  [ Duration: 8 Lectures]

(Any eight of total sessions assigned for Literary activity)

Introductory lecture on the any eight topics below:

1. Indian Knowledge System
2. Indian Culture & Civilization
3. Ancient Indian Chemistry
4. Ancient Indian Metallurgy
5. Ancient Indian Mathematics
6. Ancient Indian Astronomy
7. Indian Astronomical Instruments
8. Indian Knowledge System (Upveda: Ayurveda)
9. Indian Knowledge System (Upveda: Gandharveda)
10. Indian Knowledge System (Vedangas: Shiksha, Kalpa, Vyakrana)
11. Indian Knowledge System (Vedangas: Jyotisha, Nirukta, Chandas)
12. Indian Architecture I: Sthapatya-Veda
13. Indian Architecture II: Temples
15. Indian Philosophical System

Module 2: Introduction to Creative Practices  [ Duration: 20 Lectures]
(Twenty Lectures with at least Five different topics of total session under Creative activity)

Introductory lecture on the topics below:

1. Dhatuvada: art of metallurgy
2. Akara jnana: art of mineralogy
3. Vastuvidyā: art of engineering
4. Yantramatrika: art of mechanics
5. Takshana: art of carpentry
6. Chalitakayoga: art of practicing as a builder of shrines
7. Raupyaratnapariksha: art of testing silver and jewels
8. Maniraga jnana: art of tinging jewels
9. Sucivayakarma: art of needleworks and weaving
10. Vadya vidya: art of playing on musical instruments
11. Geet vidya: art of singing
12. Nritya vidya: art of dancing
13. Natya vidya: art of theatricals
14. Alekhyā vidya: art of painting
15. Visesahācchṛcṛyya vidya: art of painting the face and body with color
16. Uddakavadya: art of playing on music in water
17. Manasi kavyakriya: art of composing verse
18. Bhushanayojana: art of applying or setting ornaments
19. Citrasakupabhahkṣhyavikarākriya: art of preparing varieties of delicious food
20. Dasanavaśanagnaraga: art of applying preparations for cleansing the teeth, cloths and painting the body
21. Utsadana: art of healing or cleaning a person with perfumes
22. Vastragopana: art of concealment of cloths
23. Balakakridanaka: art of using children’s toys
24. Tandula kusumabali vikara: art of preparing offerings from rice and flowers
25. Pushpastaranā: art of making a covering of flowers for a bed

References:

1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru
IKS-II: Indian Culture and Civilization

Syllabus

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Course Objectives

- To introduce fundamentals of Ancient Indian Educations to understand the pattern and purpose of studying vedas, vedangas, upangas, upveda, purana & Itihasa
- To help students to trace, identify and develop the ancient knowledge systems.
- To help to understand the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the holistic development of physical, mental and spiritual wellbeing
- To build in the learners a deep rooted pride in Indian knowledge, committed to universal human right, well-being and sustainable development.

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: Introduction to IKS [ Duration: 8 Lectures]

Caturdaśa Vidyāsthānam, 64 Kalas, Shilpa Śāstra, Four Vedas, Vedāṅga, Indian Philosophical Systems, Vedic Schools of Philosophy ( Sāṃkhya and Yoga, Nyaya and Vaiśeṣika, Pūrva-Mīmāṃsā and Vedānta), Non-Vedic schools of Philosophical Systems (Cārvāka, Buddhist, Jain), Puranas (Maha-puranas, Upa-Puranas and Sthala-Puranas), Itihasa (Ramayana, Mahabharata), Niti Sastras, Subhasitas

Module 2: Foundation concept for Science & Technology [ Duration: 9 Lectures]

Linguistics & Phonetics in Sanskrit (panini’s), Computational concepts in Astadhyayi, Importance of Verbs, Role of Sanskrit in Natural Language Processing, Number System and Units of Measurement, concept of zero and its importance, Large numbers & their representation, Place Value of Numerals, Decimal System, Measurements for time, distance and weight, Unique approaches to represent numbers (Bhūta Saṃkhya System, Kaṭapayādi System), Pingala and the Binary system, Knowledge Pyramid, Prameya – A Vaiśeṣikan approach to physical reality, constituents of the physical reality, Pramāṇa, Saṃśaya

Module 3: Indian Mathematics & Astronomy in IKS [ Duration: 9 Lectures]
Indian Mathematics, Great Mathematicians and their contributions, Arithmetic Operations, Geometry (Sulba Sutras, Aryabhatiya-bhasya), value of \( \pi \), Trigonometry, Algebra, Chandah Sastra of Pingala,

Indian Astronomy, celestial coordinate system, Elements of the Indian Calendar Aryabhatiya and the Siddhantic Tradition Pancanga – The Indian Calendar System Astronomical Instruments (Yantras) Jantar Mantar or Raja Jai Singh Sawal.

**Module 4: Indian Science & Technology in IKS [ Duration: 8 Lectures]**

Indian S & T Heritage, sixty-four art forms and occupational skills (64 Kalas) Metals and Metalworking technology (Copper, Gold, Zinc, Mercury, Lead and Silver), Iron & Steel, Dyes and Painting Technology), Town & Planning Architecture in India, Temple Architecture, Vastu Sastra,

**Module 5: Humanities & Social Sciences in IKS [ Duration: 8 Lectures]**


References:

1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
4. SK Das, The education system of Ancient hindus, Gyan publication house, India
5. BL Gupta, Value and distribution system in india, Gyan publication house, India
6. Reshmi ramdhoni, Ancient Indian Culture and Civilisation, star publication .2018
7. Supriya Lakshmi Mishra, Culture and History of Ancient India (With Special Reference of Sudras), 2020.
10. Om Prakash, Religion and Society in Ancient India, Bhariya Vidhya Prakashan, 1985
12. DK Chakkrabarty, Makkhan Lal, History of Ancient India (Set of 5 Volumes), Aryan book Internation publication, 2014
13. Dr. Girish Nath Jha, Dr. Umesh Kumar Singh and Diwakar Mishra, Science and Technology in Ancient Indian Texts, DK Print World limited,
IKS-III: Indian Vision for Human Society (Vishva Kalyan thru Vasudhaiva Kutumbkam)

Syllabus

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Course Objectives

- To help the learner to understand the concept of “vasudhaiva kutumbkam” and its realization process as an base for the development of vision for a humane society.
- To help to identify the universality in humans and its coexistence in existence
- To introduce the sense of responsibility, duties and participation of individual for establishment of fearless society.
- To help to understand the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the holistic development of physical, mental and spiritual wellbeing of one and all, at the level of individual, society, nation and ultimately the whole world.

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: The world view & Vision of Human Society [ Duration: 8 Lectures]

The concept of non-duality of Prakriti (Jad) and Purush (Chetana), human as coexistence of Jad & Chetan, Pancha-mahabhutas, the root of sorrow and suffering, freedom from sorrow, salvation, eternal peace truth (vyaharika satya), ultimate truth. The acceptance of various systems of philosophy for realization of truth and complementariness in society in ancient Indian system.

Module 2: Aspiration and Purpouse of Individual and Human Society [ Duration: 8 Lectures]

Aims of Human life; at individual level and societial level. At societal level; Four purusarthas Dharma, Artha, Kama, Moksha. Individual level; Abhyudaya (progress),
Nihsreyasa (perfection) Pravrtti , Nivrvtti. Dharma; Dharma sutras (Gautama, apastamba, baudhayana, vasistha). Dharma-Shastra; (manusmriti, naradamrti, visnusmrti, yajnavalkya smriti) sociology, different stages of life like studenthood, householdership, retirement and renunciation, rites and duties, judicial matters, and personal laws (Aachara, Vyavahara, Prayashchitta). Artha; Kautliya Arthashastra, Kamandakiya Nitisara, Brihaspati Sutra, Sukra Niti, Moksha: Human liberation (Ignorance to Knowledge)

Module 3: Program for Ensuring Human Purpose: at Individual and Societal level -I [ Duration: 8 Lectures]

Fundamental concept of Nitishastra: Satyanishtha Aur Abhiruchi (Ethics, Integrity & aptitude). The true nature of self; Shiksha Valli, Bhrigu Valli (concept of Atman-Brahman (self, soul). The true constitution of Human: Ananda Valli (Annamaya Kosha, Pranamaya Kosha, Manomaya Kosha, Vijnanamaya Kosha, Anandamaya Kosha). The four states of consciousness (Waking state, Dreaming state, Deep Sleep State, Turiya the fourth state), Consciousness (seven limbs and nineteen mouths), Prajna, Awarness. The Life Force Prana (Praana-Apaaana-Vyaana-Udaana- Samaana)

Module 4: Program for Ensuring Human Purpose: at Individual and Societal level -II [ Duration: 8 Lectures]

Differentiating Vidya and Avidya, human bondages, Higher and Lower Knowledge (Para Vidhya & Apara Vidhya). Concept of Sattva, Rajas, Tamas and need of balancing the same, Patanjali yog sutra; Yama, Niyama, Asanas, pranayams, pratyahara, dhrana, dhyana, Samadhi. Sixteen category of padarth, pramans (pratyaksh, anuman, upaman, shabda). Saadhana chatushtayam (viveka, vairagya, mumukshatatavam, shadsampathi (sama, dama, uparama, titiksha, shradha, samadhana), Understanding Nitya karma, Naimittika Karma, Kamya karma, prayashchitta karma, Nishidha Karma.

Meditation and Progressive meditation (Narada’s education), Ativadin to self-knowledge, Jyan yog, Karma yog, sanyas yog in aspect to harmonious practice in society

Module 5: Practices for Ensuring Human Purpose – III [ Duration: 10 Lectures]

Practice in philosophy, architecture, grammar, mathematics, astronomy, metrics, sociology, economy and polity, ethics, geography, logic, military science, weaponry, agriculture, mining, trade and commerce, metallurgy, shipbuilding, medicine, poetics, biology and veterinary science.

References:
1. Maharaj swami chidatmanjee, Ancient Indian Society, Anmol publication pt ltd, indi
2. S. C. Manerjee, Society in Ancient India: Evolution Since the Vedic Times Based on Sanskrit, Pali, Pakrit and Other Classical Sources: No. 1 (Reconstructing Indian History and Culture), DK printing, India
11. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
18. SK Das, *The education system of Ancient hindus*, Gyan publication house, India
19. BL Gupta,*Value and disatribution system in india*, Gyan publication house, India
20. Reshmi Ramdhoni, *Ancient Indian Culture and Civilisation*, star publication ,2018
25. Dr. Girish Nath Jha, Dr. Umesh Kumar Singh and Diwakar Mishra, *Science and Technology in Ancient Indian Texts*, DK Print World limited
IKS-IV: Indian Science, Engineering and Technology (Past, Present and Future)

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Course Objectives

- To familiarize learners with major sequential development in Indian science, engineering and technology.
- To review & strengthen the ancient discovery and research in physics, chemistry, maths, metallurgy, astronomy, architecture, textile, transport, agriculture and Ayurveda etc.
- To help students to trace, identify and develop the ancient knowledge systems to make meaningful contribution to development of science today
- To help to understand the apparently rational, verifiable and universal solution from ancient Indian knowledge system for the scientific, technological and holistic development of physical, mental and spiritual wellbeing.

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: Indian Traditional Knowledge; Science and Practices [ Duration: 8 Lectures]

Introduction to the Science and way of doing science and research in India, Ancient Science in Intra & Inter Culture Dialogue & coevolution.

Traditional agricultural practices, Traditional water-harvesting practices, Traditional Livestock and veterinary Sciences Traditional Houses & villages, Traditional Forecasting, Traditional Ayurveda & plant based medicine, Traditional writing Technology
Module 2: Ancient Indian Science (Physics, Chemistry, Maths) [ Duration: 9 Lectures]

Physics in India: Vaisheshika darshan Atomic theory & law of motion, theory of panchmahabhoota, Brihath Shathaka (divisions of the time, unit of distance), bhaskarachaya ( theory of gravity, surya siddhanta & sidhanta shriomani ), Lilavati (gurutvakashan Shakti).

Chemistry in India Vatsayyana, Nagarjuna,Khanda, Al-Biruni, Vagbhata –building of the ras-shala (laboratory), working arrangements of ras-shala, material and equipment, Yasodhara Bhaṭṭa-process of distillation, appartus, saranasamskara, saranataila

Mathematics in India: Baudhayana’s Sulbasutras, Aryabhaṭṭa, Bhaskaracharya-I, Severus Sebokht, Syria, Brahmagupta, Bhaskaracharya-II, Jyeṣṭhadeva

Module 3: Ancient Indian Science (metallurgy, Astronomy, Architecture) [ Duration: 9 Lectures]

Metallurgy in India: Survarṇa(gold) and its different types, prosperities, Rajata(silver), Tamra(copper), Loha(iron), Vanga(tin), Naga / sisa(lead), Pittala(brass)

Astronomy in India Vedang Jyotish, aryabhatta siddhanta, Mahabhaskriya, Laghubhaskariya, vatesvarasiddhanta, Sisyadhivrddhida, Grahashyay, Goladhyaya, Karabakutuhala (Aryabhata, Varahamihira, Brahmagupta, Vaṭesvara, Bhaskara, Paramesvara, NilakaṇṭhaSomayaji, Jyeṣṭhadeva, ŚankaraVarman)

Architecture in India: Nagara (northern style), Vesara (mixed style), and Dravida (southern style), Indian vernacular architecture, Temple sytle, cave architecture, rock cut architecture, kalinga architecture, chandels architecture, rajput architecture, jain architecture, sikh architecture, Maratha architecture Indo-Islamic architectural, Indo-Saracenic revival architecture, Greco Buddhist style.

Module 4: Ancient Indian Science (Textile, Agriculture, Transport) [ Duration: 9 Lectures]

Textile Technology in India: Cotton (natural cellulose fiber), silk, wool (natural protein fibers), bast and leaf fibers, mridhudhautadhupitambaram (meaning a practice of fumigating the fabric with incence smoke before use as a part of the finishing process), sitadhatuvasanayugala (bleached white–a finishing process); suchhastah, sutradharah (needle and thread – tools for stiching). dyeing, washing spinning and weaving technology,

Agriculture in India: krishisuktas, Krishiparashara, Brihatsamhita, Types of crops, Manures, Types of land- devamatraka, nadimatraka, use of animals in warfare, animal husbandry, Animals for medicines.

Ancient transport in India

Module 5: Ancient Indian Science (Ayurveda & Yoga) [ Duration: 7 Lectures]

Ayurveda for Life, Health and Well-being: Introduction to Ayurveda: understanding Human body and Pancha maha bhuta, the communication between body & mind, health
regimen for wellbeing, introduction to yoga (raja yoga, astang yoga, gyan yoga), understanding of Indian psychological concept, consciousness, tridosha & triguna.

References:
1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
4. SK Das, The education system of Ancient hindus, Gyan publication house, India
5. R P Kulkarni, Glimpse of Indian Engineering and Technology (Ancient & Medieval period, Munshiram Manoharlal Publishers Pvt. Ltd. 2018
6. AK Pathak, Science and Technology in India, Anshika prakashan pratapgarh, 2016
7. PB Sharma, S. Narain, Doctors Scientists and Engineers of Ancient India, Kalpaz Publications 2017
8. NVP, Unithiri, Indian Scientific Traditions (Professor K.N. Neelakantan Elayath Felicitation Volume), publication division unieristy of Calicut, 2006
9. Anonyms, History of Science in India- Volume-I Part-I (Physics, Mathematics and Statistics), the national academy of science, India & the ramkrishna mission institute of culture, 2014
10. R N Basu, T K Bose, CS, Cakraborty History of Science in India - Agricultural Science (Volume V), the national academy of science, India & the ramkrishna mission institute of culture 2014
11. A Gosh, History of Science in India (Volume-I Part-II Astronomy), the national academy of science, India & the ramkrishna mission institute of culture, 2014
12. Dharmpal, Indian science and technology in the eighteen century, rashtrottahana sahitya, 1983
13. S Biswal, B L ray, vedic Science and technology, DK Print world, 2009
15. AR vasudev Murty, Science and Technology in Ancient India as Reflected in the Mahabharata, Sanskrit bharati, 2019
IKS-V: Indian Town Planning and Architecture

Syllabus

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Course Objectives

- To develop the knowledge and analysis on the understanding of eco-friendly, robust and scientific planning and architecture system of ancient India.
- To understand the importance of functional, aesthetic, psychological, culture and socio religious concept of ancient India architecture.
- To help the learners to trace, identify and develop the approach, process and material used in town and planning, construction and architecture
- To review and analyse the importance and significance of visual and performing arts and design in temples, houses, forts, caves and community places.
- To understand the various eco-friendly technology accepted in ancient civilization

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: The Introduction to ancient Architecture [ Duration: 6 Lectures]

Introduction to relationship between Man, Nature, Culture and city forms. Study of determinants (Natural and man-made) influencing location, growth & pattern of human settlements including types of settlements growth (Organic and Planned) and settlement forms.

Architecture as satisfying human needs: functional, aesthetic and psychological outline of components and aspects of architectural form-site, structure, skin, materials, services, use, circulation, expression, character, experience.
Understanding of the causative forces - the cultures, history, socio religious practices and institution, political and economic conditions, issues of land, climate and technology, Historical and Primitive Architecture.

Module 2: Ancient Architecture as Expression of Art & Design [ Duration: 10 Lectures]

Relationship between Art and Design with man, space and environment. Expression in Art and Architecture – concept of space, sense of enclosure-openness, robustness, dynamism, spatial geometry, Eco-friendliness.

Architecture through use of elements of visual arts such as point, line, plane, form, space, colour, texture, light, solids and voids, shadow and shade etc. Understanding of effect of scale, proportions, order, material effects such as textures, patterns, light, sound, temperature etc in architectural spaces.

Allied visual and performing arts and its relationship to build environments using colour theory, symbolism, glass painting, scriptural writing, clay moulding, stone carving.

Important Indian architecture as per elements space & form Form: specific geometry form (sphere, cube, pyramid, cylinder and cone and its sections as well as their derivatives) Space: build form space, open space, Internal and External space, Continuous spaces Centralized, Linear, Radial Clustered, Grid space

Different type of Materials used for construction in Ancient Indian architecture.


Module 3: Ancient Architecture Principle & Planning [ Duration: 8 Lectures]

Design: Principles of designing – Composition of Plan. Inception and development of the early Hindu temple form with reference to Vedic and Buddhist planning principles and design elements; Development of regional styles and manifestations thereof; Evolution of temple complexes and temple towns;

Planning: Residence- site selection, site orientation- aspect, prospect, grouping, circulation, privacy, furniture requirements, services and other factors. Vastu shastra and its importance in building interrelationship with human, nature and cosmos


Module 4: Ancient Architecture-I [ Duration: 10 Lectures]

The settlement planning pattern, elements, associated forms, typical Vedic village, towns (Dandaka, Nandyavartha etc.), typology of Shelters and civic buildings of ancient

Role of Shilpasasthras and Arthashasthra in settlement planning.

Important architecture: Great baths, Development of fortification, walled towns, structures developed eg: Stupas, Viharas, Chaityas, Stambhas, Toranas, sacred railing etc.

Study of worshipping places with especial reference to Indo Aryan / Nagara style & Dravidian style (Chola, Chalukya, Pallava, Satavahana, Hoysala, Vijayanagara etc.), design of shikharas & gopuram, rock-cut and structural examples of temples.

Module 5: Ancient Architecture-II [Duration: 8 Lectures]

Evolution of Hindu Temples in different period: Gupta, Aihole, Badami, Pattadakkal, Mahabalipuram, Indo Aryan Style in Orrisa, Khajuraho, Gujara, Rajasthan. Dravidian Style in Chola, Chalukyan, Pandya, Pallava, Hoysala Style, Revival of Hindu architecture of South India at Vijaynagara and Madurai

Tradition Indian villages & House: Regional house construction, interior & importance e.g. Rajasthani house, bhungas of kutch, nalukettu of kerala, Ikra of assam, manduva logili or illu of Andra Pradesh, wadas of Maharasthra, Mud houses of Madhya Pradesh, kathkuni of himachal Pradesh, khanjaghara of orisa, Taq and dhaaji diwari of Kashmir etc.

Scientific achievements though ancient architect: Jantar Mantar, Musical Pillars of Vitthal temple, Sundial of konark temple, construction of eight shiva temple in straight line from Kedarnath to rameshwaram at longitude 79°E 41°54, Veerbhadra temple with 70 hanging pillars, Ellora caves excavating the mountain, Jaipur plan pink city etc.

References:
1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
4. Dr. V. Ganapati Sthapati, Building Architecture of Sthapatya Veda
5. Binode Behari Dutt, Town planning in ancient India, Life Span Publishers & Distributors
7. M W Meister, South India Lower Dravidadesa - Encyclopaedia of Indian Temple Architecture (Set of 2 Books)- An Old and Rare Books, American Institute of Indian Studies, 1999
11. V K Bansal, Maha Vastu, Om Book Internation 2011
12. SS Das, The Miracles of Vaastu Shastra, pustak mahal, delhi, 2013,

IKS-VI: Indian Mathematics and Astronomy
Syllabus

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Course Objectives
- To provide information about great mathematicians and astronomers who given significant contribution in Indian mathematics and astronomy.
- To help students to trace, identify, practice and develop the significant Indian mathematic and astronomical knowledge.
- To help to understand the astronomic significance with the human holistic development of physical, mental and spiritual wellbeing.
- Enumerate the main characteristics of education system in Vedic and post Vedic period to enrich the intellectual imagination and diminish the dogmatic assurance which closes the mind against speculation.

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: The Introduction to Ancient Mathematics & Astronomy [ Duration: 6 Lectures]

Introduction to Brief introduction of inception of Mathematics & Astronomy from vedic periods. Details of different authors who has given mathematical & astronomical sutra (e.g. aryabhatta, bhaskara, brahmagupta, varamahira, budhyana, yajanvlkya, panini, pingala,
bhарат muni, sripati, mahaviracharya, madhava, Nilakantha somyaji, jyeshtadeva, bhaskara-II, shridhara)

Periodical enlisting of Mathematical & Astrological achievement in India. Evolution of Indian Numerals (Brahmi (1st century), Gupta (4th century) & Devanagri Script (11th century))

Module 2: Ancient Mathematics –I [ Duration: 9 Lectures]
Veda & Sulvasutras (Pythagoras theorem, Square root & Squaring Circle) (baudhayana sulbhasutra, apastamba sulbhasutra, katyayana sulbhasutra, manava sulbhasutra, maitrayana sulbhasutra, varaha sulbhasutra, vadhula sulbhasutra

Pingala’s chandasutras, sunya, yaat-tavat, Aryabhata ( Aryabhatiya, Asanna, ardha-jya, kuttaka,), bhaskara (trigonometory,shridhara, mahavira), Bhaskara Acharya (Sidhantashiromani), Varamahira panchasiddhantika.

Module 3: Ancient Mathematics –II [ Duration: 9 Lectures]
Brahamgupta (vargaprakrati, bhramasphuta siddhanta, bhavana), ayatavrtta, ganitasarasamgraha, lilavathi, ganesadaivajna, randavantika, suryasidhanta, grahalaghava, sadratnamala, mandavrtta, sighrartta, Bijaganita, Bakshali manuscript

Golavada, Madhyamanayanapprakara, Mahajyanayanapprakara (Method of Computing Great Sines), Lagnapprakara, Venvaroha, Sphutacandraprati, Aganita-grahacara , Chandravakyani (Table of Moon-mmemonics)

Module 4: Ancient Astronomy –I [ Duration: 9 Lectures]
Parahita system of astronomy and drk system of astronomy, Manda samskara, sighra samskara.

Vedanga Jyotisha (astronomical calculations, calendrical studies, and establishes rules for empirical observation), Aryabhatiya (earth rotation, shining of moon), Brahmasphutasiddhanta (motion of planets), varahmihira (pancasiddhantika), Mahabhaskariya, lahubhaskariya & arybhatiya bhashya (Planetary longitudes, heliacal rising and setting of the planets, conjunctions among the planets and stars, solar and lunar eclipses, and the phases of the Moon), Sisyadhiveddhida (grahadhyaya, goladhyaya), siddhantasirmanji, karanakutilaha (planetary positions, conjunctions, eclipses, cosmography), siddhantasekhara, yantra-kirmavali, Sphuṭanirṇaya, Uparagakriyakrama.

Module 5: Ancient Astronomy –II [ Duration: 9 Lectures]
Positional astronomy (sun, planets, moon, coordinate systems, precision of the equinox and its effects, eclipses, comets and meteors), Mahayuga & Kalpa system Yuga system, ayanas, months, tithis and seasons, time units, sun and moon’s motion, planet position, ayanachalana, zero-precision year, katapayaadi system, Indian nakshatra system, astronomy Instruments for naked eye astronomy (vedic observatories). The principal and application of Samrat Yantra, Jai Prakash Yantra, Disha Yantra, Rama Yantra, Chakra Yantra, Rashiwalya Yantra, Dingash Yantra, Utaansh Yantra

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Reference:

1. Textbook on IKS by Prof. B Mahadevan, IIM Bengaluru.
2. R P Kulkarni, Glimpse of Indian Engineering and Technology (Ancient & Medieval period, Munshiram Manoharlal Publishers Pvt. Ltd. 2018
3. AK Pathak, Science and Technology in India, Anshika prakashan pratapgarh, 2016
4. NVP, Unithiri, Indian Scientific Traditions (Professor K.N. Neelakantan Elayath Felicitation Volume), publication division university of Calicut, 2006
5. Dharmpal, Indian science and technology in the eighteen century, rashtrottahana sahitya, 1983
6. S Biswal, B L ray, vedic Science and technology, DK Print world, 2009
7. A Kolachana, Studies in Indian Mathematics and Astronomy, Hindustan Book agency
10. BS Yadav, Ancient Indian Leaps into Mathematics, brikausheh publication, 2010
11. DP Chatopadhya, Ravinder kumar, Mathematics, Astronomy, and Biology in Indian Tradition: Some Conceptual Preliminaries (Phispc Monograph Series on History of Philosophy, Science and Culture in India, No 3), Munshiram manohalal publication, 1995
15. KV Sharma. Ganita yuktibhasa (Analytical Exposition of the Rationales of Indian Mathematics and Astronomy, Kindle, 2021
16. R Mercier, Studies on the Transmission of Medieval Mathematical Astronomy (Variorum Collected Studies), routledge publication, 2004
IKS-VII: Indian Aesthetics (including Music and Music Instruments)

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Course Objectives
- To provide information about the foundations of Indian aesthetics as integral part of Indian culture
- To help to understand the importance of Indian aesthetics in individual realization of the truth arises by realizing the harmony within.
- To help learner to trace, identify and develop the Indian aesthetics to correlate human creative practices
- To build the learners a deep rooted pride in Indian aesthetic knowledge, committed to universal human right, well-being and sustainable development.

Detailed contents: [ Total Theory Duration : 42 Lectures]
Module 1: The Introduction to Indian Aesthetics [Duration: 5 Lectures]

The nature of aesthetics, principle, its relation to philosophy and literature: Indian traditions. Sadanga its origin and Applications of Six limbs in Indian Aesthetics Introduction to Alamkara, Rasa, Dhvani, Vakrokti, Auchitya

Module 2: Ancient Music and Music Instruments-I [Duration: 10 Lectures]

Rasa Siddhanta, the concept of Rasa, constituent of rasa (Bhav, abhinay, Sthayibhava, Vibhava, Vyabhicharibhava), number of rasa, Rasasvadana Bharata’s Natya Shastra and its Critics, Abhinavagupta’s Rasa Siddhanta., Kavyaprayojana, Sadhāranikarana, Sahrdaya, Rasavighna.

DhvaniSiddhanta, the Concept of Dhvani, Sphota, Pratibhā, classification of dhvani (Laukika Vyanga, Alaukika Vyanga, Avivaksita Vacya, Vivaksitanyapara Vacya) Anandavardana’s Dhanyaloka, with reference to Abhidha, lakshana, Vyanjana and Tatpary, extension of dhvani siddhanta to music, dance and drama.

Alamkara Siddhanta, proponent, classification of alamkara, sabdalamkara (Anuprāsa, Yamaka, Ślesha, Dhvanyātmakatā ), Arthālamkāra (Upamā, Drstanta, Virodha)

Module 3: Ancient Music and Music Instruments-II [Duration: 12 Lectures]

VakroktiSiddhanta, Kuntaka’s Vakroktijivita, Classification of Vakrokti (Varna-vinyasa vakrata (Phonetic Obliquity), Pada-purvardha vakrata (Lexical Obliquity) & Pada-parardha vakrata (Grammatical Obliquity), Vakya-vakrata (Sentential obliquity), Prakarana-vakrata (Episodic obliquity), Prabandha-vakrata (Compositional obliquity))

Different Classes of Musical Instrument as per Natyashastra of Bharat, Gana Vadya, Avanaddha Vadya, sushira vadya, tata/tantu vadya.

Brief introduction to following indian instruments

Veena, Ghatam, Gootuvadhyam, Flute, Thavil, Nadaswaram, Mridangam, Plain-drum, Harmonium, Sitar, Sarod, Shehnai, Tabla, Maddalam, violin, morsing, Tambura.

Module 4: Ancient Dance & Drama [Duration: 8 Lectures]

Natyaveda: inception from Veda (pathya words(rigveda), abhinaya gestures (Yajurveda), geet music (samaveda), rasa emotions (atharvaveda), Natya Shastra, Nata-nritya, geet-nritya, roop-nritya, bhav-nritya

Indian traditional and folk dances (bharatnatyam, kuchipudi, kathakali, yakshagan, Bhangra, Bihu, Ghumura Dance, Sambalpuri, Chhau and Garba

Module 5: Ancient Art [Duration: 7 Lectures]

Architecture, sculptures & popular art forms of Pallava& Cholas period, Chalukya & Rastrakuta period, Chandela/Hosalya period, Rajput period. Rock cut architecture, cave architecture, stupa, temples, sculpture

Hindu Shilpa texts as per Vishnudharmotara-puran, Samaranana, Sutracharana, Sukranitisara, Silparatham
Reference:

1. History of Indian Music by Swami Prajananda, Ram Krishna vedanta math, Kolkata
4. Dr. Saratchandra Shridhar Paranj, Bharatiya Sangit-ki Rupa-Rekha (Hindi) upto the Gupta period, published in the Nada-Rwpa, second issue, College of Music and Fine Arts, Banaras Hindu University, 1963.
7. Swami Prajnanananda: (Bharatiya Sangiter Lithasaf vols. I & II (Sangita Samskriti) from the primitive period to the 7th century A.D.) In Bengali (published by the Ramakrishna Vedanta Math, Calcutta), Second Edition.
12. Lalita Ramkrishna, Ancient Indian Classical Music, Shubhi Publications
IKS-VIII: Indian Health, Wellness and Psychology (including Ayurved)

Syllabus

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Course Objectives

- Understanding the fundamental principles of Indian health systems such as Ayurveda and yoga which are useful in maintaining the health of a healthy person.
- Practical implementation of health principles to correct the intake of our food, air, water and sunlight to achieve perfect health.
- Understanding traditional way of cleansing the body regularly, strengthening body with Yogic exercises, maintaining the internal balance to prevent diseases.
- Understanding our unique Mind Body Constitution and choosing the right lifestyle suitable to maintain the internal balance.
• Understanding the influence of external environment on internal health and ways to synchronise our body and mind with nature to ensure smooth functioning of all organ systems of our body.
• Understanding mind and its dynamics through knowledge of Ayurveda and Yoga and using the knowledge to maintain harmony between body and mind to achieve perfect mental health.

Detailed contents: [ Total Theory Duration : 42 Lectures]

Module 1: Understanding human body [ Duration: 8 Lectures]
Introduction to Ayurveda, the Knowledge of Life, Health and treatment aspects in Ayurveda, Influence of Pancha maha bhuta on Internal environment of Human being, Understanding composition of Human body through the concept of Dosha Dhatu Mala, Understanding Prakruthi, the Mind – Body Constitution.

Module 2: Understanding the communication between body & Mind [ Duration: 8 Lectures]
Establishing communication between body and mind by understanding the language of body. Understanding the concept of Agni, Koshta, Sara and Ojas and their relevance in enhancing our immunity to protect from various infections. Looking at the world through the lenses of Dravya, Guna and Karma Applying the principle of Samanya and Visesha in every aspect of life to achieve perfect health.

Module 3: Introduction to Health Regimen [ Duration: 12 Lectures]
Understanding Swastha vritta, the healthy regimen to maintain state of wellbeing Dinacharya, the Daily regimen including Daily detoxification, exercise, Intake of Food, Water, Air and Sunlight, work and ergonomics, Rest and sleep hygiene. Ritu charya, the seasonal regimen, Sadvratta and the concept of social wellbeing, understanding trividha upastambhas, three pillars to health, Concept of Shadrasa in choosing appropriate nourishment to the body and mind.

Module 4: Introduction to Yoga [ Duration: 07 Lectures]
Definition, Meaning and objectives of Yoga, Relevance of yoga in modern age. Brief Introduction of Hatha yoga, Raja yoga, Karma yoga, Gyana Yoga, Bhakti yoga Understanding eight steps of Ashtanga yoga, Understanding Shatkriyas, the six cleansing procedures of Yoga.

Module 5: Introduction to Indian Psychology [ Duration: 07 Lectures]
Concept of Manas in Ayurveda and understanding Mind Body harmony, Triguna based Psychology in Ayurveda and Yoga, Influence of Tri dosha on Mind, Mind body intellect and consciousness complex, Understanding Consciousness and solution to issues within Human Mind.
Reference:

1. The Charaka Samhita
2. The Susruta Samhita
3. Teh Ashtanga Hridaya
6. The Hatha yoga pradipika
7. The Patanjali yoga sutras
8. The Gheranda samhita
10. Swamy Satyananda Saraswati, Asana, Pranayama, Mudra and Bandha, Bihar School of Yoga, 2002