ADMISSIONS PROSPECTUS 2025

SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING
PRASANTHI NILAYAM
सत्यं वद धर्मं चर



PROFESSIONAL

SSSIHL
The Underlying Philosophy

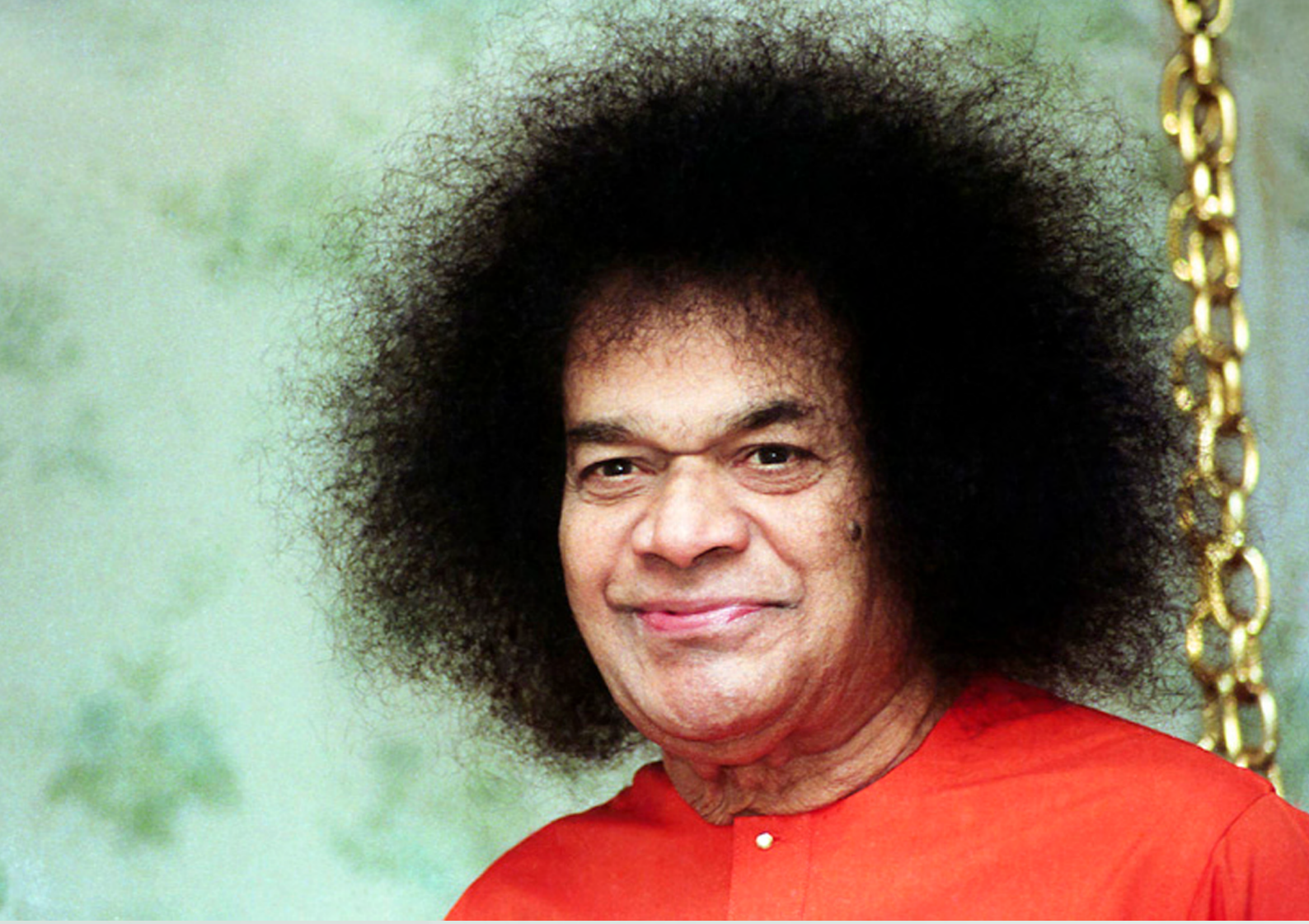
The Sai educational institutions have been established not merely to enable students to earn a living but to make them acquire good traits, lead ideal lives, and give them ethical, moral and spiritual strength. I have established them with a view to inculcate love and teach good qualities to students. They will learn here humility, discipline and faith.

I have established these institutions to impart spiritual education as a main component and worldly education as a secondary one. Education should enable one to cultivate good qualities, character and devotion. The teaching of the university curricula is only the means employed for the end, namely, spiritual uplift, self-discovery and social service through love and detachment.

This will be a Gurukula – a place where teachers and taught will grow together in love and wisdom - and like the ancient system of education, it will develop in its students a broad outlook and promote virtues and morals, which serve to foster noble ideals in society.

This Institute will be a temple of learning where youth are shaped into self-reliant, contented and enterprising heroes of action and self-sacrifice, for the purpose of serving humanity.

SRI SATHYA SAI BABA
Revered Founder Chancellor, SSSIHL



from the admissions office

Welcome to Sri Sathya Sai Institute of Higher Learning (SSSIHL).

This prospectus is for students interested in applying to study for **professional programmes at SSSIHL**. The first few pages will give you an introduction to the institute and why SSSIHL is so unique. It will give you information on the application process, programme descriptions and detailed information on each professional programme available for 2025 admissions.

Detailed information about the Institute and the admissions process can also be found on our website, sssihl.edu.in/admissions. Please visit this page to get full details on the Progammes for Admissions, Dates & Deadlines, download admissions-related documents (such as model test papers), view the comprehensive admissions Application Guide, and of course, apply online.

Good luck and Sai Ram!

Admissions Office
Office of the Registrar, SSSIHL

Contents

WHY SSSIHL

HOW TO APPLY

PROGRAMMES FOR ADMISSIONS

Overview | Eligibility | Courses

A modern Gurukula

THE BEST OF BOTH WORLDS

Sri Sathya Sai Institute of Higher Learning (Deemed to be University), Prasanthi Nilayam, Andhra Pradesh, India, has been a visible manifestation of Bhagawan Sri Sathya Sai Baba's vision of education for human transformation for over 50 years.

Bhagawan Baba designed Sri Sathya Sai Values-based Integral Education to ensure deep inner transformation of students, teachers and staff during their time at SSSIHL. Ethics and values are integrated as the undercurrent of every subject taught at the Institute.

As a result, combined with academic and research excellence, the Institute provides its students with a holistic framework of interpersonal development.

In addition to their studies, the compulsory residential character at SSSIHL trains the mind, body and spirit of the student in an environment similar to the ancient Indian 'gurukula' system of education, in the most modern context.

Teachers and students live and grow together in an atmosphere of mutual trust and unity. This helps students develop a wholesome and balanced personality, where academic competence is intertwined with value systems.

This concept is unique at the university level of education.

The university provides **quality education totally free of cost to all students** for all programmes of study.

OUR CAMPUSES

The Institute hosts students from across the country at its four campuses located in Andhra Pradesh and Karnataka, India:

For Women:

- Anantapur Campus at Anantapur, Andhra Pradesh

For Men:

- Prasanthi Nilayam Campus at Puttaparthi, Andhra Pradesh
- Brindavan Campus at Kadugudi, Bangalore, Karnataka
- Nandigiri Campus at Chikkaballapur, Karnataka

All SSSIHL campuses are located in areas surrounded by mountains, greenery and nature, which helps create an ambience for integral education that the Institute curricula imparts.

Visit our Campuses page to learn more.
You can also see the Facilities students have access to.

Prasanthi Nilayam Campus
B.A. | B.P.A. | B.S. | M.A. | M.Sc. | M.Tech. | Ph.D.

Anantapur Campus
B.A. | B.Com. | B.Ed. | B.S. | M.A. | M.Sc. | M.B.A. | Ph.D.

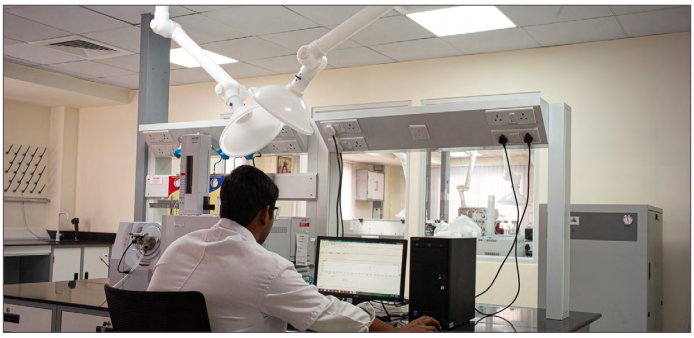
Brindavan Campus
B.B.A. | B.Com. | B.S. | M.B.A. | Ph.D.

Nandigiri Campus
B.A. | B.S. | M.Sc.

In this university, the medium of instruction is discipline.
The first, second and third languages are love, service and sadhana (spiritual discipline).

Sri Sathya Sai Baba, Revered Founder Chancellor, SSSIHL

Distinctive Features



SSSIHL IS UNIQUE

Admissions

- Free, high-quality education for all students
- Merit-based open admissions policy for all, irrespective of income, religion or region

Residential Character

- Compulsory residential character where all students, doctoral research scholars and select teaching faculty reside together in the hostel. This enables the translation of lessons learned into practical skills through experiential learning
- Spiritual ambience in an environment of discipline and love
- Cultivation of the spirit of self-reliance, brotherhood and sacrifice through mentoring and personal example

Infrastructure

- Campuses set in spacious and peaceful surroundings
- Well-equipped, modern science laboratories and a cutting-edge Research Instruments Facility
- Automated Library using an Integrated Library Management System (ILMS) with a digitisation facility accessed through the online Public Access Catalogue (OPAC) within the campus premises
- Libraries across campuses with over 1,90,000 volumes
- Connected to the National Knowledge Network (NKN)
- Wi-Fi enabled campuses with 10 Gigabit Ethernet connectivity
- Computer and Multimedia learning centres
- International Centre for Sports at the Prasanthi Nilayam Campus and multiple sports facilities at other campuses

Academics & Research

- 4-year undergraduate curriculum aligned to NEP 2020, extending to Postgraduate studies
- Student-teacher ratio 10:1
- Research collaborations with premier Indian and International Institutions and Industry
- Interdisciplinary / multidisciplinary research for societal benefit
- Awareness Programmes and Moral Classes reinforcing human values

Integral Education

- Life lessons learned through the message of the Revered Founder Chancellor, Bhagawan Sri Sathya Sai Baba
- Integrating human values with secular knowledge
- Inculcating the spirit of self-reliance and service to society
- Synthesis of science and spirituality for societal benefit

The concept of integral education that SSSIHL imparts is pursued by all teachers, staff, and students.

Sri Sathya Sai Values-based Integral Education

THE PROCESS

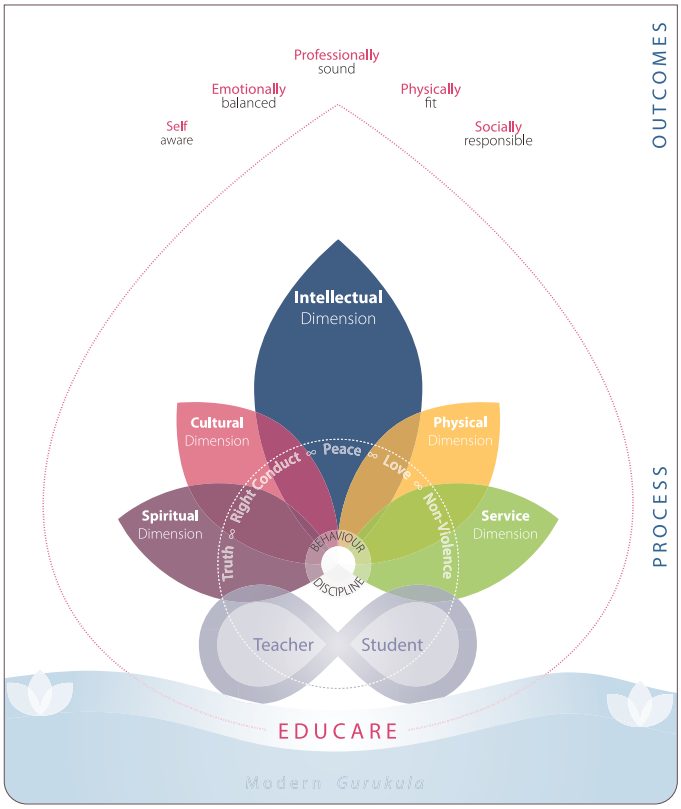
Sri Sathya Sai Values-based Integral Education is a modern, rational, scientific education system rooted in Indian ethos. It takes the best of both ancient and contemporary learning techniques.

As depicted in the diagram, the base is the concept of a modern Gurukula that sustains all relationships and activities at SSSIHL. It is responsible for creating and sustaining the congenial environment necessary for the teacher-student interaction to grow and develop.

Adherence to discipline and appropriate behaviour are the two important aspects that encompass all interactions. The 5 human values of Truth, Right Conduct, Peace, Love and Non-violence form the undercurrent of the integral education's dimensions.

These dimensions are Intellectual, Physical, Cultural, Devotional and Service. The key activities for each dimension form the basis of most of a student's time at SSSIHL.

Bhagawan Baba purposefully designed the system of Integral Education so that students spend their time on academics (intellectual capacities) and developing other qualities. This concept is very unique at the university level. See the Integral Education Activities for further details.



Sri Sathya Sai Values-based Integral Education

THE OUTCOME

The outcomes of the system of Values-based Integral Education at SSSIHL are threefold. It prepares all graduates to be:

- Professionally sound
- Emotionally balanced
- Physically fit
- Socially responsible and
- Self aware

It helps develop a strong character and positive qualities in students and nurtures virtues like adaptability, tolerance and sacrifice, shaping them into noble and responsible citizens.

LEARN MORE

Visit the About Us section of our website to learn more about the uniqueness of SSSIHL.

THE DAILY ROUTINE

This is a crucial component of this process.

Each student's day starts at 5:00 a.m., with a couple of hours spent in prayer, exercise and other vocational pursuits (such as practice sessions for music, band, traditional Indian music, etc.).

Classes commence at 9.00 a.m. and end at around 4:00 p.m.

Students then move to the Sports Field / Mandir / Prayer Hall for participation in sports and games / congregational chanting (Veda), multifaith prayers / devotional singing / bhajans, and other spiritual activities. These also include talks by eminent speakers on a variety of spiritual topics.

Post dinner, students continue to concentrate on their studies. before lights out at around 10 p.m.

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Sri Sathya Sai Baba
Revered Founder Chancellor, SSSIHL

SPIRITUAL dimension

major activities

- Multifaith Prayers / Devotional Singing / Bhajans
- Vedic chants and stotrams
- Meditation & Silent sitting
- Multifaith Awareness sessions
- Suprabhatam (prayer at dawn)
- Assembly (college prayer)
- Brahmarpanam (food prayer)
- Kshama Prarthana (night prayer)

Enables a student to connect to her/his inner Self, resulting in a calm, focused & intuitive mind.

This inner connection opens the heart and brings forth the feeling of love, compassion and empathy for fellow human beings.

CULTURAL dimension

major activities

- Celebration of Festivals
- Brass Band
- Nadaswaram & Panchavadyam
- Annual Sports & Cultural Meet
- **Performing Arts**: Music programmes, Drama & Dance
- **Fine Arts**: Rangoli, Cardmaking, Photography, Altar making
- Public Speaking
- Debates and Elocution

Creates avenues for individual artistic expression of a student's creative potential through various art forms and helps develop an appreciation of the different facets of culture.

PHYSICAL dimension

major activities

- Games
- Sports
- Annual Sports & Cultural Meet
- Jogging
- Exercises
- Yogasnas

A healthy body results in a healthy mind. This dimension trains a student to overcome her/ his physical limitations and strive for excellence

SERVICE dimension

major activities

- **Self-reliance Departments**: Electricals, Plumbing (water supply), Audiovisual, General store, Dispensary, Dietary services, Hostel mess, Arts & Crafts, costumes & props, etc.
- Community living
- Social work
- Voluntary work
- Grama Seva (Village Service)
- Community engagement
- Prasadam distribution

Enables a student to experience the deep inner satisfaction of giving joy to others through selfless service.

INTELLECTUAL dimension

major activities

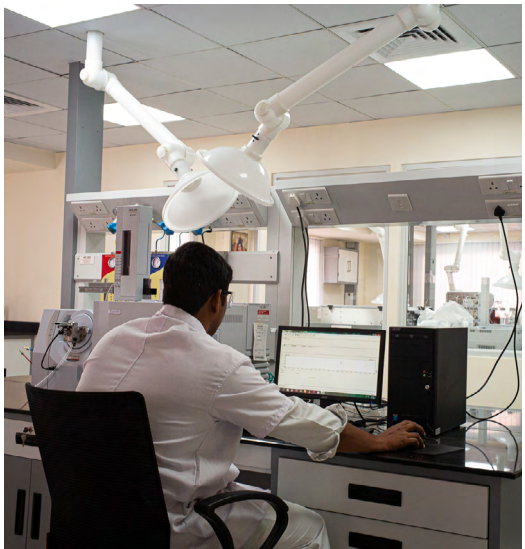
- Academic Studies
- Research
- Workshops & conferences
- Colloquiums & symposiums
- Talks and discussions during assembly
- Awareness class
- Moral class (Thursdays)
- Prayer Talks
- Annual Summer Course in Indian Culture & Spirituality

Promotes the acquisition of both secular and spiritual knowledge.

Apart from academics and research, the activities in this dimension include Awareness Courses, Moral Classes and Prayer Talks.

Ayyagari Sathya Sai Srikar
I M.Sc. Mathematics, SSSIHL

GATE 2024: All India Rank 1
Data Science and Artificial Intelligence



SSSIHL in numbers

admissions

3 years average | **2022-24**
per year

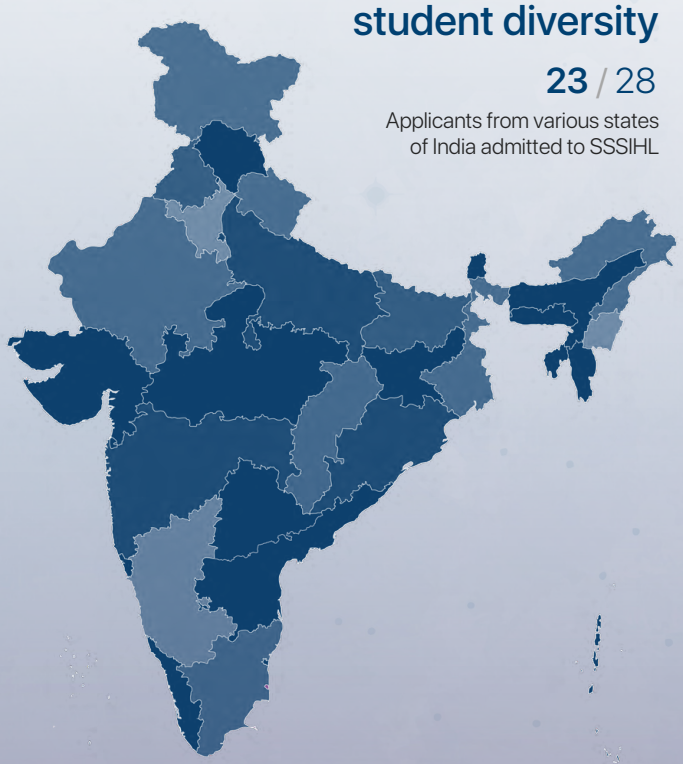
697 total admissions

32% acceptance rates

697 / 2183
accepted / eligible applicants

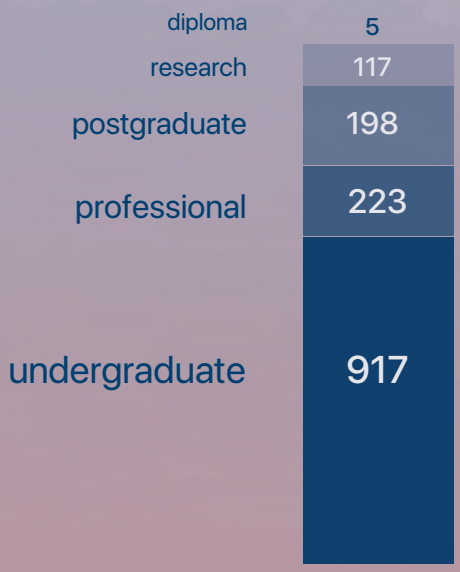
student diversity

23 / 28
Applicants from various states of India admitted to SSSIHL

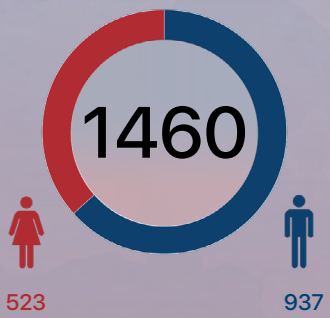


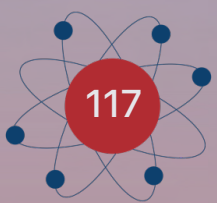
students

academic year 2023/24



by Programme





doctoral research scholars
8% of student body

by Campus

SSSIHL in numbers

students
academic year 2023/24

10:1

student-teacher
ratio

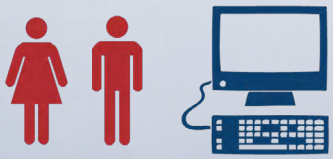
per student per year

₹ 2.30 lakh

expenditure

₹ 6.25 crore

equipment & infrastructure

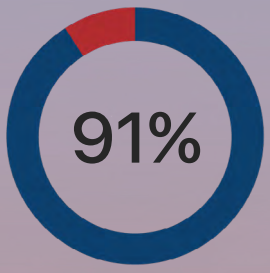


2:1

student-computer
ratio

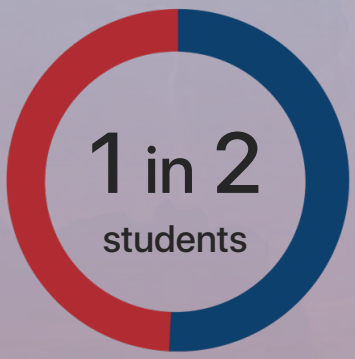
use of computers is always 1:1

students
academic year 2023/24



examinations
pass rate

UNDERGRADUATE

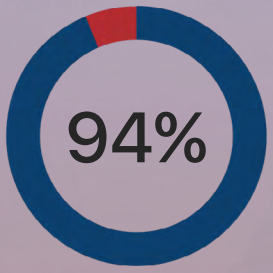


75/153

national examinations

number of final year SSSIHL postgraduate students that qualified

GATE, CSIR, JRF, NET, LS, JEST, CTET, UPSC IAI, ACET, CB3, CM2, CP3, CP2, CS1, DS1 and MAS



examinations
pass rate

POSTGRADUATE
PROFESSIONAL

SSSIHL in numbers

research
academic year 2023/24

161

research publications
in peer-reviewed journals

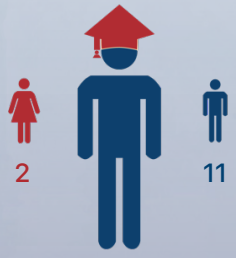
45% increase from the Academic Year 2022/23

₹ 3.68 crores

research & teaching grants

13

Ph.D. awardees

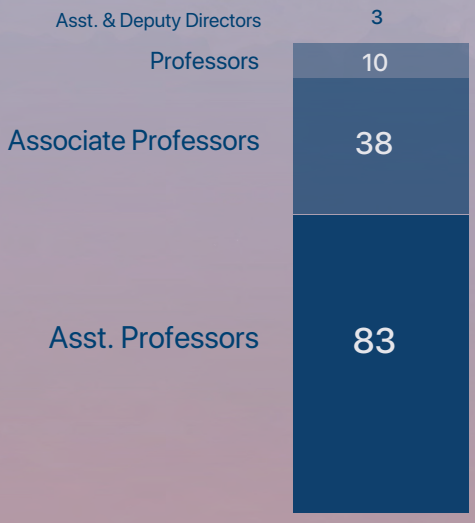


101

conference presentations

23% increase from the Academic Year 2022/23

staff
academic year 2023/24



Faculty
full-time

202

total staff
full-time

134 Faculty (full-time)
50 Administrative
13 Technical
5 Library

71%

PhD

in addition, 20 faculty are pursuing their Ph.D.

other faculty

Adjunct
Visiting
Guest Lecturers
Honorary

184

Hostel Life

Genesis

The philosophy of hostel life is based on the approach of community living: each one lives for the other and all live together for a common higher cause.

Students from different states of India, and varied economic and cultural backgrounds live in dormitory-styled accommodation with 10-14 students staying together in a room. the aesthetically pleasing hostel buildings also create a noble ambience for students to live in.

As a result, the hostel is a miniature model of the world outside with people of different habits, temperaments, lifestyles, language and outlook staying together and working. This develops the qualities of understanding, adjustment, sharing and caring amongst the students. It nurtures virtues like adaptability, tolerance and sacrifice; developing students into noble and responsible citizens.

The ambience is suffused with both discipline and loving care. All doctoral research scholars reside with the students in the hostel. The relationship between the students and teachers is very cordial and warm, and the teachers pay personal attention to the problems of each and every student. The teachers are chosen with extreme care to play an important role in this process. Many of them are alumni of the Institute, dedicated and well versed in integral education. They serve as facilitators and are available at all times for mentoring the students on personal and academic matters.

Personal cleanliness, punctuality and regularity, general behaviour, personal etiquette and room cleanliness are the major components of the discipline that is followed at SSSIHL hostels.

The ideal Sai student

The Revered Founder Chancellor, Sri Sathya Sai Baba said, "Knowledge, when skilled, leads to balance which in turn provides insights about the application of knowledge for the benefit of society." He, therefore desired (as shown in the diagram below) that students graduating from this university should possess:

- The Head of Shankara that symbolizes knowledge leading to wisdom
- The Hands of Janaka that symbolizes knowledge translated to skills for societal benefit
- The Heart of Buddha that symbolizes compassion to balance the head with the hands

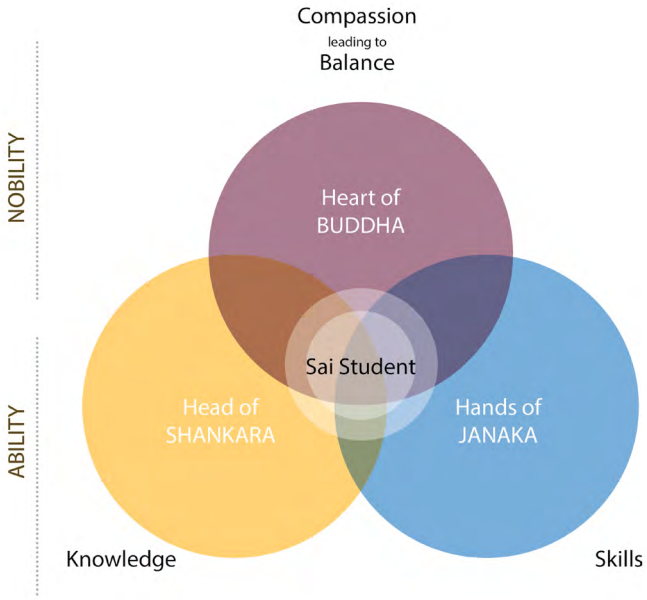
Self Reliance Departments

A major portion of the functioning of the hostel is taken care of by the students and resident staff members. The guiding principles of the hostel are a simple life coupled with self reliance. Students do their work with least dependence on external agencies. To inculcate the dignity of labour and respect for work, most functions and departments of the hostel are run by students under the able guidance of resident faculty.

The self reliance departments include:

- Electrical
- Plumbing (water supply)
- Audiovisual
- General store
- Dispensary
- Dietary services
- Hostel Mess
- Arts & Crafts
- Costumes & props

These self reliance activities enable students to become self-confident and independent. They also contribute to developing leadership and entrepreneurial skills. To maintain continuity and effective succession planning, senior students train the junior students in all aspects of respective self reliance departments before graduating.



Harmony of Head-Heart-Hand

SSSIHL Anantapur Campus Brass Band students with Smt. Droupadi Murmu, Hon'ble President of India
SSSIHL XLII Convocation, 22 Nov 2023, Prasanthi Nilayam

The end of Education is Character

SRI SATHYA SAI BABA

Application Process

SSSIHL is unique

As detailed in the Introduction pages above, SSSIHL is unique in several ways.

Firstly, aligned with the vision of Bhagawan Sri Sathya Sai Baba, **education at SSSIHL is provided FREE to all students for all programmes of study.**

This commitment aims to eliminate financial barriers and promote access to quality education for all deserving candidates, fostering an inclusive learning environment.

SSSIHL **does not** levy any of the following fees:

- Tuition fees
- Admissions fees
- Infrastructure & Development fees
- Library fees
- Examination fees
- Basic amenities fees
- Sports fees
- Medical fees*

**students have access to free medical treatment at Sri Sathya Sai General and Sri Sathya Sai Super Speciality Hospitals located at Prasanthi Nilayam and Whitefield, Bangalore.*

Hostel fees: Boarding and lodging charges will be communicated to selected candidates.

Secondly, owing to the unique system of education, we have the following notice that applies to all applicants (at all levels of study):

Programmes for Admissions

As a first step, carefully review in detail the descriptions of the programmes you are interested in. These can be found from page 18 onwards in this prospectus.

Each programme includes an **overview**, **eligibility requirement**s (for that particular programme) and a comprehensive **list of courses** in each year (per semester of study).

Eligibility

The requirements for admissions vary from programme to programme. See the individual Programme pages for detailed information.

Candidates who do not meet all the admissions criteria listed for the programme they apply to will not be eligible for admissions.

Sri Sathya Sai Institute of Higher Learning (Deemed to be University) has a merit-based Admissions Policy open for all.

NOTE: Relaxation of admissions norms for special categories is applicable as per the Govt. of India guidelines.

Application Guide

Note: Applications for admissions to all SSSIHL programmes are **ONLINE ONLY**.

After you have decided on what programme to apply for, head over to the Application Guide. This page will give you step-by-step guidance on how to successfully apply for a programme at SSSIHL.

Once you submit your online application, you will not be able to change it.

Therefore, it is very important you go through the Application Guide and read the important information it provides on various aspects of the application such as Registration for Online applications, what documents to upload, and what happens at each stage of your application process.

Dates & Deadlines

Next, to make sure you don't miss out on a chance to apply to SSSIHL, kindly visit the Dates & Deadlines page of the Admissions section of the website.

Documents Checklist

Before you fill in your application form, in order to save time, make sure you keep these key documents ready in a digital format before you register and apply online.

All documents uploads must be clear, legible and attested (where required). Failure to meet these requirements may result in your application being rejected.

The documents you must upload are:

1. **One passport-sized photograph**
   Latest photograph of the applicant in the prescribed format mentioned in the application form
2. **Statement of Marks**
   Self-attested (by the applicant) photocopies of the Statement of Marks for X Std. issued by your Higher Secondary School Board

   Self-attested (by the applicant) photocopies of the Statement of Marks for XII Std. (XI Std. if XII Standard exam results are not published) issued by the authority

   Note: Selected candidates are required to bring in their original, attested mark sheets for XII Std. for verification at the time of joining SSSIHL.
3. **Application fee payment receipt**
   A copy of the application fee payment receipt.
4. **Photo identification proof**
   A clear copy of any Government approved Photo ID, such as your Aadhaar card.
5. **For special categories as per Govt. of India**
   A self-attested copy of the relevant certificate issued by the statutory authorities (state / central)

NOTICE TO ALL APPLICANTS

Given the unique modern Gurukula system of Values-based Integral Education at SSSIHL, **it is mandatory that all students study and reside at gender-specific campuses during their entire period of study**.

Apply Online

Once you are ready with the above, visit the Apply Online page.

Registration
The first step is to register online with a valid email address (email ID). This is done on the Apply Online page. Kindly refer to Step 1 of the Application Guide for full details.

Filling and submission of your Application Form

You can then begin filling in the admissions application form online. Kindly refer to Step 5 of the Application Guide for full details.

Note: All your information is transmitted through a secure server and is kept fully confidential. Your application information and accompanying credentials are reviewed only by authorized representatives of the Institute.

Admissions Technical Viva Voce, Group Dicussions & Interviews

Next, you must wait to hear from the Institute in regards to the outcome of your application. Applicants who meet the eligibility criteria for the programme they applied for will then proceed to the next step of their application.

The list of candidates selected for the round of interviews will be published on the Admissions Lists page of the website.

Note: All notifications to applicants from SSSIHL during the entire admissions application process will be sent to your registered **email address**.

B.Ed. programme: There is no admissions test. Applications will be shortlisted based on merit. The shortlisted candidates will be asked to attend an online interview.

M.B.A. programme: Eligible applicants will be asked to take an online admissions test. Shortlisted candidates will then be invited for a Group discussion and an interview.

Applicants with valid score in CAT, CMAT or XAT are exempted from the admissions test and will be invited directly for the Group Discussion round, followed by an interview.

M.Tech. programmes: Eligible applicants will be asked to take an online admissions test. Shortlisted candidates will then be invited for an Technical Viva Voce, followed by an interview.

Applicants with a valid GATE/CSIR/JEST score in relevant fields are exempted from the admissions test and will be invited directly for the Technical Viva Voce round, followed by an interview.

Admissions Test Syllabus
Candidates applying for the M.B.A., M.Tech. in Computer Science or the M.Tech. in Optoelectronics & Communications, can view the Admissions Test Syllabus on page 27.

If you do not meet the eligibility criteria for the programme you applied for, you will be notified accordingly via email.

Results: Provisional List of Selected Candidates

Once you have attended the interview, the Institute will publish the list of selected candidates on the Admissions Lists page.

This page will be regularly updated as and when the Admissions team scrutinizes and processes applications at each stage of the admissions process.

Join SSSIHL!

Congratulations! You have got an opportunity to study at Sri Sathya Sai Institute of Higher Learning.

List of Documents to be submitted upon admission to SSSIHL

All newly admitted candidates must submit the following to the Director of the Campus on the opening day of the academic year:

- Original Marks Certificate of X and XII Standard
- Original / Provisional Degree Certificate (or marksheets of all previous semesters / years of your current degree, if the results are not yet published)

1 July 2025
Academic year 2025/26 commences

- Transfer certificate
- Conduct certificate
- Health Record
- Special category certificate (if applicable)

How do I contact the admissions Office if I need further help?

The Admissions pages of the website are designed to make sure that candidates have all the information required to successfully apply to SSSIHL.

If you still need further assistance please contact us either by email or telephone.

By Email:
For admissions related queries, please email us on **admissions@sssihl.edu.in**.

We will answer all email enquiries within two working days of receipt of your email.

By Telephone:
To contact the admissions office for Admissions related queries, please telephone:

+91 9441 911 391 or
+91 83310 34774 or
+91 8555 287239 (landline)

The above numbers are for admissions related queries for the Institute (SSSIHL) only.

Lines are open between 9:30 a.m. and 4:30 p.m., Monday to Saturday.

Outside of these hours, please email us admissions@sssihl.edu.in.

You are wished the very best.
Sai Ram!

Student Support

For information related to admission of international students, admissions policies, code of conduct, anti-ragging and grievance redressal mechanisms, etc., please visit the Student Support page of our website.

Programmes for Admissions

There are **separate programmes** available for **Women** and **Men** applicants, as the Institute hosts separate campuses for women and men students.

Given below are the **Professional Programmes** open for admissions in 2025.

Professional Programmes (2 years)

MEN candidates

- **M.B.A.**
- **M.Tech.** in **Computer Science**
- **M.Tech.** in **Optoelectronics & Communications**

WOMEN candidates

- **B.Ed.**
- **M.B.A.**

Common Courses for all Programmes

360 degrees learning

The unique aspect of all degree programmes at SSSIHL is that the curriculum encompasses a wide variety of types of courses: Discipline Specific and Interdisciplinary Elective Courses, Ability Enhancement courses, Multidisciplinary courses, Major Discipline Specific Core courses, Interdisciplinary Minor courses, Skill Enhancement courses, Values-based courses and Research work & projects.

These are incorporated in the programme descriptions given in this prospectus.

In addition, students spend many hours of their courses on non-classroom study: seminars, conferences, tutorials, practical and laboratory work, internships, field trips and engaging with their communities.

Public Speaking

Students are also encouraged to come forward and speak in front of the SSSIHL community on topics ranging from science to metaphysics, thus giving them an appropriate platform to develop their public speaking skills and to refine their thought process.

THURSDAY MORAL CLASSES

At each campus, Thursday mornings begin with an hour of inspiring and ennobling talks by speakers focusing on their personal spiritual experiences, messages from sacred scriptures and other elevated and socially relevant themes. It is also used to highlight students' talents in music, dramatics, elocution, debates, quizzes, etc.

Sample Topics: Why are Values Important?, Sai Student, Moral values from the Ramayana, Divine Directions, Role and Importance of Guru, Debate on How Government Should Regulate Social Media, Yoga & Holistic Human Health, Significance of Festivals of India (all religions) and several sessions on Experiences and teachings of our Revered Founder Chancellor.

PRAYER TALKS

Every morning before classes commence at the college, all students and teachers gather for the morning assembly. Multifaith prayers / devotional singing / bhajans and a few minutes of silent sitting are sometimes followed by a talk by students, faculty members or invited guests on topics related to morals and values.

Sample Topics: Power of Thoughts, Trust in God's Timings and Have Faith in His Decisions, Self-Love – A Path to your Inner Self, Choice of Freedom, Certainty in Uncertainty.

AWARENESS COURSE

Each semester, students take an Awareness Course. These mandatory, credited courses are common to all programmes of study and are designed to cultivate a broad view of the human condition in students.

These mandatory courses are designed to cultivate a broad view of the human condition in students. The course content helps trigger self-reflection and enquiry and sensitises students to the concerns of society, and gets them to think about practical solutions to these problems.

Awareness Courses for **Academic Year 2025/26** for **Professional Programmes** are:

YEAR 1

Semester 1
B.Ed. – Education for Life
M.B.A. – Indian Ethos and Values – Part 1
M.Tech. – Fundamentals of Indian Culture

Semester 2
B.Ed. – God, Society and Man
M.B.A. – Indian Ethos and Values – Part 2
M.Tech. – Sources of Values

YEAR 2

Semester 3
B.Ed. – Guidelines for Morality
M.B.A. – Values in Management – Part 1
M.Tech. – Work Culture, Ethics and Values

Semester 4
B.Ed. – Wisdom for Life
M.B.A. – Values in Management – Part 2
M.Tech. – SSSIHL's Core Values and Philosophy

Programme Descriptions

The following pages will highlight the information for each individual professional programme of study at SSSIHL for 2025 entry.

This includes: the length of the programme, whether it is applicable for women candidates or men or both, the eligibility criteria and a programme overview, and a full list of courses of study for each year (and semester).

NOTICE

Based on the changing requirements of the UGC, NCTE, AICTE, employability, industry, entrepreneurship, skill development and research, SSSIHL may revise or update any aspects of a programme without written notice.

B.Ed.

For Women

OVERVIEW

The Bachelor of Education (B.Ed.) programme is meticulously crafted to equip individuals with the necessary skills and knowledge to embark on a fulfilling career in education. Primarily designed to prepare aspiring educators for diverse teaching roles, it equips students to excel in various levels of the education system. From Upper Primary or Middle Level (Class VI-VIII) to Secondary Level (Class IX-X) and Senior Secondary Level (Class XI-XII), the programme ensures that graduates possess the expertise to teach and inspire students effectively.

The two-year program provides ample opportunity for student-teachers to develop into reflective practitioners. Its course layout ensures a thorough exploration of key themes and extensive practical engagement with children, schools, and communities. Additionally, it features targeted courses to strengthen the students' professional skills.

The unique aspect of this programme is that it stresses the importance of imparting values-based education to students, resulting in their wholesome and balanced development.

National Council for Teacher Education (NCTE) approved programme.

ELIGIBILITY

- 10+2 years of schooling from a recognized board and 3 years of university (total 15 years)
- Either passed or appeared for Final exams at Bachelor's degree level before Admissions. If not appeared for Bachelor's degree final exams, aggregate marks in all the preceding Years/Semesters put together will be considered
- Candidates with at least 50% marks either a Bachelor's degree and/or in a Master's degree in Science / Social / Humanities / Bachelor's in Engineering or Technology with 55% marks or any other qualification equivalent thereto, are eligible to apply
- Preferably below 28 years as of 30th June in the year of admission

COURSES

YEAR 1

Semester 1

- Basics of Education
- Childhood and Growing Up
- Information and Communication Technology in Education
- Pedagogy of Teaching – Group I*
- Pedagogy of Teaching – Group II**
- School Attachment Programme 1 (SAP 1)
- Education in Human Values
- Awareness Course I: Education for Life

* Any one: English or Physical Science or Telugu or Hindi
** Any one: Mathematics or Biological Science or Social Science

Semester 2

- Contemporary India and Education
- Learning and Teaching
- Assessment for Learning
- Pedagogy of Teaching – Group I*
- Pedagogy of Teaching – Group II**
- School Attachment Programme 2 (SAP 2)
- Reading and Reflecting on Text
- Awareness Course II: God, Society and Man

* Any one: English or Physical Science or Telugu or Hindi
** Any one: Mathematics or Biological Science or Social Science

YEAR 2

Semester 3

- School Administration and Action Research
- Language Across Curriculum
- Elective – I
- Internship Phase – I
- Awareness Course III: Guidelines for Morality

Semester 4

- Knowledge and Curriculum
- Creating an Inclusive School
- Gender, School and Society
- Drama and Art in Education
- Understanding the self
- Elective – II
- Internship Phase – II
- Awareness Course IV: Wisdom for Life

ELECTIVES 1

- Yoga Education
- Peace Education
- Disaster Management
- Selected online courses from SWAYAM

ELECTIVES 2

- Guidance and Counseling
- Environmental Education
- Health and Physical Education

M.B.A.

For Women & Men

OVERVIEW

The SSSIHL M.B.A. Programme is a transformative professional course that blends advanced managerial skills with core ethical values in a dynamic, gurukul-inspired environment.

Designed to cultivate professional expertise and responsible leadership, the programme ensures a well-rounded approach to business management. It focuses on equipping students with the strategic, analytical, and interpersonal skills essential for success while fostering a deep commitment to values, social responsibility, and sustainable business practices.

This holistic framework prepares graduates to excel as leaders and ethical decision-makers in today's rapidly evolving business landscape. The programme comprises four key components:

Foundation Courses focus on universal human values and cover subjects such as Values-based Management, Leadership and organisational transformation and Awareness courses on Indian ethos and values.

Core and Functional Courses cover concepts and techniques connected with functional management in Marketing, Operations, Finance and Human Resources.

Integrative Courses cover subjects that span different functions and disciplines, such as Management Science, Business Analytics, Enterprise Resource Planning and Business Strategy.

Electives offered within two specialization options:

Stand-alone Specialization: Students can choose 11 electives within a single functional area, such as Finance, Marketing, Actuarial Science or Human Resources.

Dual Specialization: Students can select a major and minor from Finance, Marketing, Human Resources, Operations, Analytics or Business Sustainability.

They must complete six electives for the major and five for the minor.

A minimum of eight students is required for each specialization stream.

The programme emphasizes experiential learning, enabling students to apply classroom learning to real-world challenges. From Massive Open Online Courses (MOOCs) to Industrial Visits, frequent interaction with industry stalwarts, and internships, the programme helps develop leadership skills through transformational experiences.

Additionally, it includes a two-month summer internship from May to June and a capstone project to ensure practical, hands-on learning.

Courses utilize diverse teaching methods, including seminars, conferences, presentations, case studies, games, and simulations, along with activity-based learning and ICT-enabled classrooms, making learning engaging and holistic.

As a result, SSSIHL M.B.A. graduates are equipped to drive positive social and economic change in India and abroad. With a strong foundation in leadership and innovation, they are prepared to tackle real-world challenges and contribute to sustainable growth in communities worldwide.

All India Council for Technical Education (AICTE) approved programme.

ELIGIBILITY

- 10+2 years of schooling from a recognized board and 3 years of university (total 15 years)
- Either passed or appeared for Final exams at Bachelor's degree level before the date of Admissions Test. If not appeared for Bachelor's degree final exams, aggregate marks in all the preceding Years/Semesters put together will be considered
- Applicants with a valid score in CAT, CMAT or XAT are exempted from the admissions test and will be invited directly for the Group Discussion round, followed by an interview. (Cut-off score for CAT, XAT and CMAT is 70%)
- Preferably below 28 years as of 30th June in the year of admission

COURSES

YEAR 1

Semester 1

- Economics for Managers
- Values-Based Management
- Marketing Management
- Organisational Behaviour
- Accounting for Financial Decisions
- Business, Government & Society
- Spread Sheet Modelling
- Statistical Methods for Decision-making
- Business Communication
- Awareness Course I: Indian Ethos and Values – Part 1

Semester 2

- Human Resource Management
- Research Methods for Managers
- Management Science
- Business Analytics
- Corporate Finance
- Operations Management
- Contemporary Business Environment
- Elective I
- Elective II
- Awareness Course II: Indian Ethos and Values – Part 2

YEAR 2

Semester 3

- Business Law
- Group Dynamics
- Elective III
- Elective IV
- Elective V
- Elective VI
- Elective VII
- Awareness Course III: Values in Management – Part 1

Semester 4

- Contemporary Business Strategy
- Entrepreneurship & Innovation
- Leadership & Organisational Transformation
- Agile Project Management
- Elective VIII
- Elective IX
- Elective X
- Elective XI
- Awareness Course IV: Values in Management – Part 2

M.Tech. in Computer Science

For Men

OVERVIEW

This is a master's programme for students with backgrounds in science and engineering. It teaches the theoretical foundations of Computer Science and provides practical knowledge of computer systems.

This is achieved primarily through core theoretical courses. The programme is designed to include a software lab associated with each course, imparting working knowledge and programming skills for solving problems.

A well-structured list of electives from various areas, such as Computer Vision, Machine Learning, Data Analytics, High Performance Computing, and Software Systems, enables students to specialize in frontier areas of computer science.

The M.Tech. programme at SSSIHL allows students to customize their expertise through diverse specializations, including Intelligent Systems and Knowledge Engineering, Advanced Computer Networks, Human-Computer Interaction, Theoretical Computer Science, Computer Systems, Multi-Core and Parallel Computing, Software Engineering, and Mathematical Methods in Computer Science.

GENERAL ELECTIVES

Throughout the course, students can select their preferred focus in all four semesters, tailoring their academic journey to align with their specific interests and career goals. They can also choose from any four electives from a broad range of streams (see the list of Courses).

A comprehensive Viva Voce and project work in the second year prepares graduating students with the necessary knowledge and skills for the next stage of their careers upon graduation.

As a result, the specific programme outcomes include the application of knowledge in mathematics, computer science, and programming, the ability to identify and solve engineering problems in specialized areas, contribution to research and innovation, formulation of evaluation criteria for well-informed conclusions, understanding the global impact of engineering solutions for sustainable development, and professional functioning with ethical responsibility in both individual and multidisciplinary team contexts.

Graduates will have the necessary tools to succeed in diverse fields, fostering problem-solving skills through interactions with industry experts and emphasizing recognition for analytical, research, design, and implementation skills.

INTERNSHIP

Students are encouraged to undertake an Industry Internship for a minimum period of 2 months and maximum of 6 months after the first year of study.

All India Council for Technical Education (AICTE) approved programme.

ELIGIBILITY

- Either passed or appeared for final exams of one of the following:

  M.Sc. in Mathematics / M.Sc. in Physics / M.Sc. in Computer Science / M.C.A., **or** B.E. in Computer Science / B.Tech. in Computer Science
- Candidates with a Bachelor's degree (B.E. / B.Tech.) in Computer Science, Computer Science and Engineering, Electronics & Communications Engineering (with a background in Computer Science*) and Information Technology (with Mathematics background) are eligible to apply
- Familiarity with the following is mandatory for admissions:

  Mathematics: Calculus of one and several variables, Sequence and Series, Linear Algebra and Matrix Theory, Differential equations and Laplace Transforms, Mathematical logic.

  Computer Science: Data Structures and Simple Algorithms, Computer Organization and Architecture, Data communications and Networks, Database Systems, Languages Translators
- Candidates with valid a GATE/CSIR/JEST score in relevant fields can appear directly for the second round of the admission process – Technical Viva Voce Round
- Age: preferably below 28 years on 30th June in the year of admission

* A implies adequate, formal training and qualification from a recognized institution or relevant Computer / IT industry / academic experience for a minimum period of 5 years

COURSES

YEAR 1

Semester 1

- Design and Analysis of Algorithms
- Practical: Design and Analysis of Algorithms
- Advanced Computer Architecture
- Practical: Advanced Computer Architecture
- Practical: Parallel Processing, Parallel Processing
- Elective – I
- Seminar – I
- Seminar – II
- Semester End Viva Voce
- Awareness Course I: Fundamentals of Indian Culture

Semester 2

- Theory of Computation
- Distributed Systems
- Practical: Distributed Systems
- Topics in Database Management Systems
- Practical: Topics in Database Management Systems
- Elective – II
- Elective – III
- Mini Project
- Awareness Course II: Sources of Values

YEAR 2

Semester 3

- Elective – IV
- Problem-Solving Lab
- Project Work Review
- Awareness Course III: Work Culture, Ethics and Values

Semester 4

- Project Work
- Comprehensive Viva Voce
- Awareness Course IV: SSSIHL's Core Values and Philosophy

ELECTIVES

Stream 1: **Intelligent Systems and Knowledge Engineering**

- Artificial Intelligence
- Natural Language Processing
- Machine Learning
- Mining of Big Data Sets
- Deep Learning
- Fundamentals of Blockchain Technologies and Applications

Stream 2: **Advanced Computer Networks**

- Wireless and Mobile Networks

Stream 3: **Human-Computer Interaction**

- Digital Image Processing
- Medical Image Processing
- Computer Vision

Stream 3: **Human-Computer Interaction**

- Digital Image Processing
- Medical Image Processing
- Computer Vision

Stream 4: **Theoretical Computer Science**

- Advanced Algorithms
- Cryptography
- Design of Quantum Algorithms

Stream 5: **Theoretical Computer Science**

- Advanced Programming in the Unix Environment

Stream 6: **Multi-Core and Parallel Computing**

- High-Performance Computing with Accelerators
- Cloud Computing

Stream 7: **Software Engineering**

- Object Oriented System Design

Stream 8: **Mathematical Methods in Computer Science**

- Mathematical Methods in Image Processing
- Numerical Methods in Image Processing
- Mathematical Methods for Data Mining

M.Tech. in Optoelectronics & Communications

For Men

OVERVIEW

What are the technologies that harness the power of light? How does a WhatsApp video sent from thousands of kilometres away reach you in a fraction of a second? Can your data travel at the speed of light? Can you send light to a 'conductor' like an electric current? If yes, what electronic devices generate, detect, and control it?

The answer is Optoelectronics and Communications. As electronics did in the 20th century, this set of revolutionary technologies will have a unique impact on human progress in the 21st century.

This interdisciplinary program seeks to develop skilled professionals in the expansive fields of Optoelectronics and Communications, focusing on Optical Communications, Optical Networking, Signal Processing, Very Large Scale Integration (VLSI) technologies, Computer Programming, and Automation.

Students can design, construct and use optoelectronic devices for sensor applications. They will also get hands-on experience with optical fibers and fiber-based components. They will become proficient in building and analyzing computer networks and Optical Networking technologies.

STRUCTURE

One-half of the courses are core papers, and the other half are electives, enabling students to pursue their academic interests.

The core courses provide a strong foundation in science and engineering. They are supplemented by laboratory courses, which allow students to take on project work in the second year. This training makes them highly compatible and ubiquitous in leading industries and R&D organizations worldwide.

The electives help students tailor their programme according to their interests and skills. They can select any five electives from diverse streams (refer to the list of courses).

In Year 1, in the second semester, students must complete a mini-project.

In Year 2, students pursue a full-term, industry-mentored project, working with mentors from leading Networking, Communications and Semiconductor industries. This project provides students with the ultimate training to apply the technologies they learn and serves as a heads-up to meet industry requirements.

At the end of each semester, every student will undergo a credited Viva Voce conducted by a panel of faculty members to help them prepare for technical interviews.

CAREER OPTIONS

The programme equips students for careers in telecommunications, fiber optics, photonics, and optoelectronic devices, enabling them to contribute to the advancement of essential technologies used in fields such as medicine, defense, manufacturing, communication networks, and renewable energy.

In a broader sense, they will be equipped to grasp how engineering solutions affect contemporary global economic, environmental, and societal contexts for sustainable development.

INTERNSHIP

Students are encouraged to undertake an Industry Internship for a minimum period of 2 months and maximum of 6 months after the first year of study.

All India Council for Technical Education (AICTE) approved programme.

ELIGIBILITY

- The candidate must have either passed or appeared for final exams of one of the fol-lowing:
- M.Sc. Physics, **or** B.E. / B.Tech. in Electronics and Electrical engineering (ECE) / Electrical & Electronics Engineering (EEE) / Electronics and Instrumentation Engineering (EIE)
- Candidates with a valid GATE/CSIR/JEST score in relevant fields can appear directly for the second round of the admissions process – Technical Viva Voce round
- Age: preferably below 28 years on 30th June in the year of admission

COURSES

YEAR 1

Semester 1

- Optoelectronics and Optoelectronic Sensors
- Digital Communication Systems
- Broadband Communication Networks
- Elective – I
- Optoelectronics Lab
- Fiber Optic Components Lab
- Algorithm Development Lab
- Awareness Course I: Fundamentals of Indian Culture

Semester 2

- Optical Communication Systems
- Optical Networks
- Elective – II
- Elective – III
- Entrepreneurship and Innovation
- Network Lab
- Automation Lab
- Mini Project
- Awareness Course II: Sources of Values

YEAR 2

Semester 3

- Elective – IV
- Elective – V
- Network Security Lab
- Project Work
- Awareness Course III: Work Culture, Ethics and Values

Semester 4

- Project Work
- Awareness Course IV: SSSIHL's Core Values and Philosophy

ELECTIVES

Stream 1: Optoelectronics

- Principles of Photonics
- Optical Instrumentation
- Integrated Optics
- Biomedical Optics and Biophotonics

Stream 2: Networking and Communications

- IoT and Sensor Networks
- Network Security
- Wireless Communication Networks
- AI & ML in Cyber Security

Stream 3: Very Large Scale Integration (VLSI) Technology

- Principles of VLSI
- VLSI Design & Test
- FPGA Based Design
- Embedded Systems and RTOS
- ASIC Design
- Digital Logic Design

Stream 4: Robotic Technologies

- Embedded Signal Processing
- Adaptive Signal Processing
- Image Processing and Computer Vision
- Robotic Instrumentation and Sensors
- Robot Programming
- Fundamentals of AI for Robotics

OPEN ELECTIVES

- Introduction to Virtualization Technologies
- Software Engineering
- Microfluidics: Devices and Applications
- Biomedical Signal Processing
- Data Structures and Algorithms
- Computer Organization and Architecture
- Basics of Managing a Business

Admissions Test Syllabus

The SSSIHL admissions test is applicable to only the following programmes:

M.B.A. programme: Eligible applicants will be asked to take an online admissions test. Shortlisted candidates will then be invited for a Group discussion and an interview.

Applicants with valid score in CAT, CMAT or XAT are exempted from the admissions test and will be invited directly for the Group Discussion round, followed by an interview.

M.Tech. programmes: Eligible applicants will be asked to take an online admissions test. Shortlisted candidates will then be invited for a Technical Viva Voce, followed by an interview.

NOTES

- There will be negative marking for all multiple choice questions.
- Model Test Papers are accessible on the Institute's website - on the Admissions Downloads page.

M.B.A.

There will be three written tests of three hours total duration. They would be of a pattern similar to CAT, GMAT and MAT:

English

60 questions | 1 hour

This test assesses the candidate's command of English and Grammar, vocabulary, and ability to use words and phrases effectively. It is also intended to determine the candidate's ability to read and rapidly digest literature, extract qualitative and quantitative information, and communicate precisely.

Quantitative Analysis & Logical Reasoning

30 questions | 45 minutes

This test is intended to assess the candidate's ability to handle quantitative information quickly and accurately. It also determines the candidate's ability to draw valid inferences from available data, using logical reasoning and simple mathematical formulae.

Management Aptitude

30 questions | 30 minutes

This test aims to assess the candidate's aptitude for the Management profession and his ability to comprehend facts and analyse a given situation and to determine the candidate's awareness of national and international issues.

Written English

15 minutes

A short essay on a specific theme.

Reference Books

Standard books used for CAT/MAT/ GMAT Entrance Examinations.

M.Tech. in Computer Science

Question Paper Format

For the written test, the question paper is divided into two parts:

Written Test

120 Marks | 2 hours

Computer Science (67%) and Mathematics (33%) in two parts:

Part A: 80 Objective type items – 80 Marks (80 min.)
60 multiple-choice questions in Computer Science and 20 in Mathematics.

Part B: Short Answer type Questions – 40 Marks (40 min.)
4 short answer type questions each in Computer Science and Mathematics

General English Aptitude Test

20 Marks | 30 minutes

Essay-type questions to test English language written communication skills

Technical Viva Voce

(subject to qualification in first component)

60 Marks

The oral test assesses comprehension of the basics as well as analytical abilities. The viva will also include questions on programming, which will test proficiency in designing, coding, and debugging in C, C++ or Java languages.

Final Interview

An interview is the final selection round for candidates who qualify after the Viva voce.

Computer Science

Data Structures and Algorithms
Asymptotic Relations, Sorting Algorithms, Searching Algorithms, Basic Data Structures like Linked List, Doubly Linked List, Circular Linked List and Binary Tree. Abstract Data Types like Stacks, Queues and Graphs.

Computer Organization and Architecture
Computer Arithmetic, Instruction Set Architecture Characteristics, Instruction Cycle, CISC, RISC, Super Scalars Architectures, Instruction Formats, Addressing Modes, Pipelining and Instruction Level Parallelism, Speed-up of a Processor, Control Hazards, Basics of Cache, Cache Coherence, Basics of I/O, Interrupts.

Data Communication and Networks
Packet/circuit switching, loss, delay, throughput in a network, protocol layers, OSI & TCP/IP, HTTP, FTP, Electronic mail, DNS, Client server vs P2P architecture, Transport-layer Multiplexing and demultiplexing, sliding window protocols, TCP & UDP protocols, Principles of reliable data transfer, congestion control, Virtual circuit and datagram networks, IPv4, IPv6, Routing algorithms, Multiple access protocols, Error correction-detection, Wireless and Mobile Networks, GSM, CDMA, 802.11 standard, handling mobility in cellular networks, basics of physical layer.

Database Systems
Database languages, View of Data, Relational Model, SQL: set operations, Aggregate functions, Nested Sub queries, Joined relations; ER Model: Constraints, Weak Entity sets, Generalization, Specialization, Reduction to Relational Schemas; Normalization: Different Normal Forms, Functional Dependency, Multi-valued Dependency; Transaction: Transaction concept, ACID properties, Serializability, Recoverability, Testing for serializability.

Operating Systems and System Programming
The concept of a process, operations on processes, process states, concurrent processes, process control block, process context, Job and processor scheduling, scheduling algorithms, Problems of concurrent processes, critical sections, mutual exclusion, synchronization, deadlock, Memory organization and management, storage allocation. Virtual memory concepts, paging and segmentation, File organization: blocking and buffering, file descriptor, directory structure, Basics of assemblers, Macro preprocessors and compilers.

Object Oriented Programming Concepts
Principles of Object Oriented Programming, Classes, objects, constructors and destructors, Operator overloading, Type conversions, Type of constructors, Function overloading, Inheritance, Polymorphism, File stream – File operators.

Calculus of One and Several Variables
Limit, continuity, differentiation and integration of functions of one or more variables. Directional derivative and gradient of a function.

Mathematics

Linear Algebra
Vector spaces, subspaces, basis, linear transformation, matrix of linear transformations, system of linear equations and their solutions using Gaussian elimination method, Eigen values and Eigen vectors, diagonalization of a linear transformation.

Discrete Mathematics
Set theory, Mathematical logic, Relations and functions, Trees and Graphs.

Probability and Statistics
Random variables, discrete and continuous distributions including Bernoulli, binomial, uniform, Poisson, exponential, hyper-geometric distributions, expectation, moments, central limit theorem, law of large numbers, random sample, sample mean, sample variance, mean, median and mode.

Reference Books

Computer Science

- Data structures and algorithms in C by Mark Allen Weiss
- Computer Organization and Design by David A. Patterson and John L. Hennessy, Elsevier Pub.
- Computer Networking: A Top-Down Approach, 4/E James F. Kurose, Keith W. Ross, Pearson Pub.
- Data Base System Concepts by Silberschatz, Korth and Sudarshan, Tata McGraw Hill Pub.
- Systems programming by Leland Beck, 3rd edition, Pearson India.
- C++ How to Program, 4/e by Harvey M. Deitel and Paul J. Deitel

Mathematics

- Calculus by Stanley I. Gossman, Academic Press Pub.
- Linear Algebra by Larry Smith, 3rd edition, Springer Verlag.
- Discrete Mathematical Structures by Kolman, Busby and Ross, 4th Ed., Pearson Pub.
- Advanced Engineering Mathematics by Kreyszig, 8th ed., Wiley Eastern, 1999.
- Differential Equations by Shapley L. Ross John Wiley and Sons Pub.

M.Tech. in Optoelectronics & Communications

Question Paper Format

For the written test, the question paper is divided into two parts:

General English Aptitude Test

20 Marks | 30 minutes
Essay-type questions to test English language written communication skills

Written Test

70 Marks | 3 hours
Multiple Choice questions (Part A + B)

Part A: Common for B.E. / B.Tech. / M.Sc. in Physics (30 Marks)

Part B: for Engineering students only (40 marks)

Part B: for M.Sc. in Physics applicants only (40 marks)

Technical Viva Voce

(subject to qualification in first component)

30 Marks

Final Interview

An interview is the final selection round for candidates who qualify after the Viva voce.

Part A Syllabus

Common for B.E. / B.Tech. / M.Sc. in Physics (30 Marks)

Linear Algebra
Determinates, system of linear equations, Eigenvalues and eigenvectors, Diagonalization of matrices.

Calculus
Limit, continuity and differentiability: Hospital rule, Maxima and minima, Taylor's series, Evaluation integrals, Lagrange multipliers, Power series, Fourier series and Fourier Transforms.

Programming & Numerical Methods
Data Types & Declarations, Program Organization, Arithmetic Statements, Flow of Control-Iterative Statement

Conditional statement, Unconditional branching, arrays, functions and procedures, pointers, classes, file handling.

Errors, Interpolation, curve fitting, root finding, solutions of algebraic system, Numerical integration, Numerical Differentiation.

Probability and Statistics
Descriptive Statistics: Measures of Central Tendency (Mean, Median, Mode), Measures of Dispersion (Range, Variance, Standard Deviation)

Basics of Probability, Conditional Probability and Independence, Bayes' Theorem and its Applications, Probability Distribution Functions (PDFs), Cumulative Distribution Functions (CDFs), Mean and Variance of Random Variable, Bernoulli Distribution, Binomial Distribution, Poisson Distribution, Uniform Distribution, Normal Distribution, and Exponential Distribution

Part B Syllabus

For Engineering students only (40 Marks)

Network Theory
Network Graphs and Solution Methods (Kirchoff's Laws), Thevenin and Norton Theorems, Wye-Delta transforms

Signals and Systems
Laplace transforms, Fourier Series and Transforms, Z transforms, LTI system analysis

Control Systems: Transfer Functions and Steady state errors and Stability criterion, State Variable Formulation

Communications
Analog communications: AM, FM. Digital communications: PCM, ASK, PSK, FSK, Matched filter, and BER

Electronics and Semiconductors
Ohm's law, Resistance, Capacitance, Inductance in DC and AC circuits. Ammeter, Voltmeter, Multimeter and Oscilloscope

PN junction, Physics of carrier transport, Diffusion, Resistivity, Mobility, Diode circuits, LEDs, Laser diodes

BJTs, JFETs, MOSFETS, OpAmp Circuits, Amplifiers, Filters and oscillators Boolean Algebra, Logic Gates, Combinatorial circuits, Latches, Flip flops, Counters, Shift registers, ADC, DAC

Electromagnetics and Optics
Electromagnetics: Electromagnetic Spectrum (radio waves to Gamma rays) and applications, Maxwell's Equations and boundary conditions, plane waves, phase and group velocity, Fresnel equations for reflection and transmission at dielectric interface, Evanescent waves in dielectrics, Skin Depth in Conductors, Modes in Waveguides.

Reflection and Refraction, Convex and Concave Lenses and Mirrors, Imaging using Simple and Compound Microscopes, TIR, Two beam Interference, Single Slit Diffraction and Diffraction Grating, Production and Properties of Plane Polarised light. Basic properties of laser light and laser cavities.

Part B Syllabus

For M.Sc. in Physics applicants only (40 Marks)

Classical Mechanics
Newtonian mechanics, Lagrange's

Classical Mechanics
Newtonian mechanics, Lagrange's and Hamilton's formalisms; Equation of motion, Poisson bracket; Small oscillations, Normal modes; Wave equation, Relativistic kinematics, Mass-energy equivalence

Atomic and Molecular Spectroscopy
Spectra of One- and Many-electron atoms, LS and JJ coupling, Zeeman and Stark Effects, X-ray Spectra, Rotational and Vibrational Spectra of diatomic molecules, Franck Condon principle, Raman Effect, NMR and ESR

Solid State Physics
Crystal structure and bonding

Elements of X-ray crystallography

Free electron theory and Band theory of solids

Optical, dielectric and magnetic properties of solids

Electronics and Semiconductors
Ohm's law, Resistance, Capacitance, Inductance in DC and AC circuits. Ammeter, Voltmeter, Multimeter and Oscilloscope

PN junction, Physics of carrier transport, Diffusion, Resistivity, Mobility, Diode circuits, LEDs, Laser diodes.

BJTs, JFETs, MOSFETS, OpAmp circuits, Amplifiers, Filters and oscillators

Algebra, Logic Gates, Combinatorial circuits, Latches, Flip flops, Counters, Shift registers, ADC, DAC

Electromagnetics and Optics
Electromagnetics: Electromagnetic Spectrum (radio waves to Gamma rays) and applications, Maxwell's Equations and boundary conditions, plane waves, phase and group velocity, Fresnel equations for reflection and transmission at dielectric interface, Evanescent waves in dielectrics, Skin Depth in Conductors, Modes in waveguides.

Reflection and Refraction, Convex and Concave Lenses and Mirrors, Imaging using Simple and Compound Microscopes, TIR, Two beam Interference, Single Slit Diffraction and Diffraction Grating, Production and Properties of Plane Polarised light. Basic properties of laser light and laser cavities.

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