



**12 Day Offline Faculty
Development Program on
Calculus as Ganita:
Computational Methods of
Aryabhata and Brahmagupta**

14th July 2025 to 26th July 2025

Organized by



**Department of Electrical & Electronics
Engineering**
(Accredited by National Board of Accreditation)
**The National Institute of Engineering,
Mysuru**
*(An Autonomous, Grant-in-aid Institution under
VTU Belagavi)*

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The National Institute of Engineering



The National Institute of Engineering (NIE), established in the year 1946, today stands in the band of 151 to 200, among top engineering colleges in the country as per National Institution Ranking Framework (NIRF-2023) announced by the Ministry of Human Resources Development (MHRD). It is ranked 17th among India's top Engineering Colleges, as per survey conducted by The Week. NIE is managed by a registered society and nine out of ten current directors are distinguished alumni of the institute. NIE is a grant-in-aid institution and approved by the All-India Council for Technical Education (AICTE), New Delhi. NIE got autonomous status from Visvesvaraya Technological University, Belagavi in 2007. It has been accredited by NAAC. Seven out of Eight Undergraduate Programmes: Civil Engineering, Mechanical Engineering, Electrical & Electronics Engineering, Electronics & Communication Engineering, Industrial & Production Engineering, Computer Science & Engineering, Information Science & Engineering and three PG Programme – Structural Engineering, Machine Design and Hydraulics have been accredited by the National Board of Accreditation, New Delhi, under Tier-I. It is one of the 14 colleges in Karnataka that has been recognized under MHRD-World Bank sponsored Technical Education Quality Improvement Programme (TEQIP) in all the three phases. All the Departments of NIE are recognized as Research Centre under VTU and AICTE for QIP. Currently, NIE offers 7 UG and 10 PG Programs.

**Department of Electrical & Electronics
Engineering**

The Department of Electrical & Electronics Engineering was established in 1958. It offers Bachelor's degree in Electrical & Electronics Engineering, master's degrees in Power Systems and Computer Applications in Industrial Drives. The department is recognized as a research centre to carry out Ph.D programmes. The department has a Centre of excellence – CEMATEA, authorized by electrical inspectorate, Government of Karnataka to carry out periodical testing of various electrical installations in industries and other organizations in and around Mysuru.

Theme of the FDP

This course aims to teach calculus as it developed in India from the 5th century onwards, beginning with Āryabhaṭa, focusing on its formulation as the numerical solution of differential equations. Instead of formal real numbers and limits, this uses the avyakta ganita of Brahmagupta (today known as the non-Archimedean field of rational functions). This is combined with the philosophy of zeroism. Zeroism involves discarding or zeroing of infinitesimals and small quantities (for example in summing infinite series, as in the sum of an infinite geometric series given by Nilakantha). This Indian method is ideally suited for implementation on present-day high-speed computers using floating-point numbers. Prof. C K Raju's software CALCODE would be used for this course.

Compared to usual university calculus courses, this course offers several advantages. (1) It leads to greater conceptual clarity (compared to formal real numbers and limits). (2) It is far easier than the usual dreaded calculus courses. (3) It hence enables students to solve much harder problems never covered in usual calculus courses, such as non-elementary elliptic integrals. (4) Unlike usual calculus courses, real, practical applications to physics and engineering are covered. (5) The existing open-sources software for symbolic manipulation such as MAXIMA is taught as a part of this course to emphasize the irrelevance of the "skill" of symbolic manipulation (tricks to calculate derivatives and elementary integrals).

For detailed abstract refer the following link
<https://tinyurl.com/calc-ganita>

Outcomes of the FDP

- ❖ Historical and philosophical background. Rejection of axiomatic (formal) mathematics (Reasoning minus empirical) as against philosophy of Ganita (Reasoning plus empirical)
- ❖ Origin of calculus in India which used finite differences and recursive technique in arriving at precise trigonometric values and its 1000 year of journey in becoming more accurate and its contemporary superior pedagogical value.
- ❖ Significance of non-Archimedean field of rational functions (Brahmagupta's polynomial arithmetic) along with philosophy of zeroism in achieving conceptual clarity

❖ Solution of harder real life calculus problems not covered in usual calculus courses

For detailed 40 hour syllabus refer to following link
<https://tinyurl.com/calc-cont>

Resource Person

Prof.C. K. Raju, PhD (ISI), TGA Laureate
Honorary Professor, Indian Institute of Education. (Ex-Tagore Fellow, Indian Institute of Advanced Study)

Author of

Time: Towards a Consistent Theory

The Eleven Pictures of Time

Cultural Foundations of Mathematics

Euclid and Jesus

Is Science Western in Origin?

Refutation of the Aryan Race Conjecture

Venue

Sarvepalli Radhakrishna Hall
Administrative Block, South Campus
The National Institute of Engineering, Mysuru



Who can attend?

Faculty members from Engineering College, working
Professionals and practicing Engineers from various

Research Organizations and Industries, PG students
& Research Scholars.

Participation Certificate

E-certificate will be issued to all those participants who have attended the program with a minimum 90% attendance and provided the feedback on the course.

Registration Details

Registration Fees: 1770/- (1500+18% GST)

Max. No. of Participants: **40**

Reg fee includes working lunch and tea

Enter the details in the following google form

<https://forms.gle/VEPTjburNYvg7mPp9>

Last Date for registration: **30th June 2025**

Address for Correspondence

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SCAN & PAY

