

PROFORMA PART 1,2,3

PROPOSAL FOR 'INSTITUTION OF EMINENCE DEEMED TO BE UNIVERSITY'



AMRITA
VISHWA VIDYAPEETHAM

Contents

Part 1.1.a	2	Part 1.IV.f	128
Part 1.II.a	4	Part 1.IV.g	132
Part 1.II.b	5	Part 1.IV.h	142
Part 1.II.c	11	Part 1.IV.i	148
Part 1.II.d	12	Part 1.IV.j	152
Part 1.II.e	16	Part 1.IV.k	156
Part 1.II.f	23	Part 1.IV.l	160
Part 1.II.g	24	Part 1.IV.m	164
Part 1.II.h	27	Part 1.IV.n	166
Part 1.II.i	32	Part 1.IV.o	167
		Part 1.IV.o	168
Part 1.III.a	34	Part 1.V.a,	188
Part 1.III.b	38	Part 1.V.b	188
Part 1.III.c	60	Part 1.VI.a.....	238
Part 1.III.d	72	Part 1.VI.b.....	238
		Part 1.VI.c.....	239
Part 1.IV.a	76	Part 1.VI.a.....	239
Part 1.IV.b	120	Part 1.VI.b.....	239
Part 1.IV.c	122	Part 1.VI.c.....	239
Part 1.IV.d	124	Part 1.VI.a.....	239
Part 1.IV.e	126	Part 1.VI.b.....	240
		Part 2.I.a	242

Part 3.I.a	244	Part 3.III.n	248
Part 3.I.b	244	Part 3.III.a	248
Part 3.I.c	244	Part 3.III.b	248
Part 3.I.d	244	Part 3.III.c	248
Part 3.I.e	244	Part 3.IV.a	248
Part 3.I.f	244	Part 3.IV.b	249
Part 3.I.g	244	Part 3.IV.c	249
Part 3.I.h	245	Part 3.IV.d	249
Part 3.II.a	245	Part 3.IV.e	249
Part 3.II.b	245	Part 3.IV.f	249
Part 3.III.a	245	Part 3.IV.g	249
Part 3.III.b	245	Part 3.IV.h	249
Part 3.III.c	246	Part 3.IV.i	250
Part 3.III.d	246	Part 3.IV.j	250
Part 3.III.e	246	Part 3.IV.k	250
Part 3.III.f	246	Part 3.IV.l	250
Part 3.III.g	247	Part 3.V. a	251
Part 3.III.h	247	Part 3.V. b	251
Part 3.III.i	247	Part 3.V. c	251
Part 3.III.j	247	Part 3.VI. a	251
Part 3.III.k	247	Part 3.VI. b	251
Part 3.III.l	247	Certificate	252
Part 3.III.m	248		



PART 1

I.

Particulars of
Institution /
Proposed Institution

Part 1. Ia

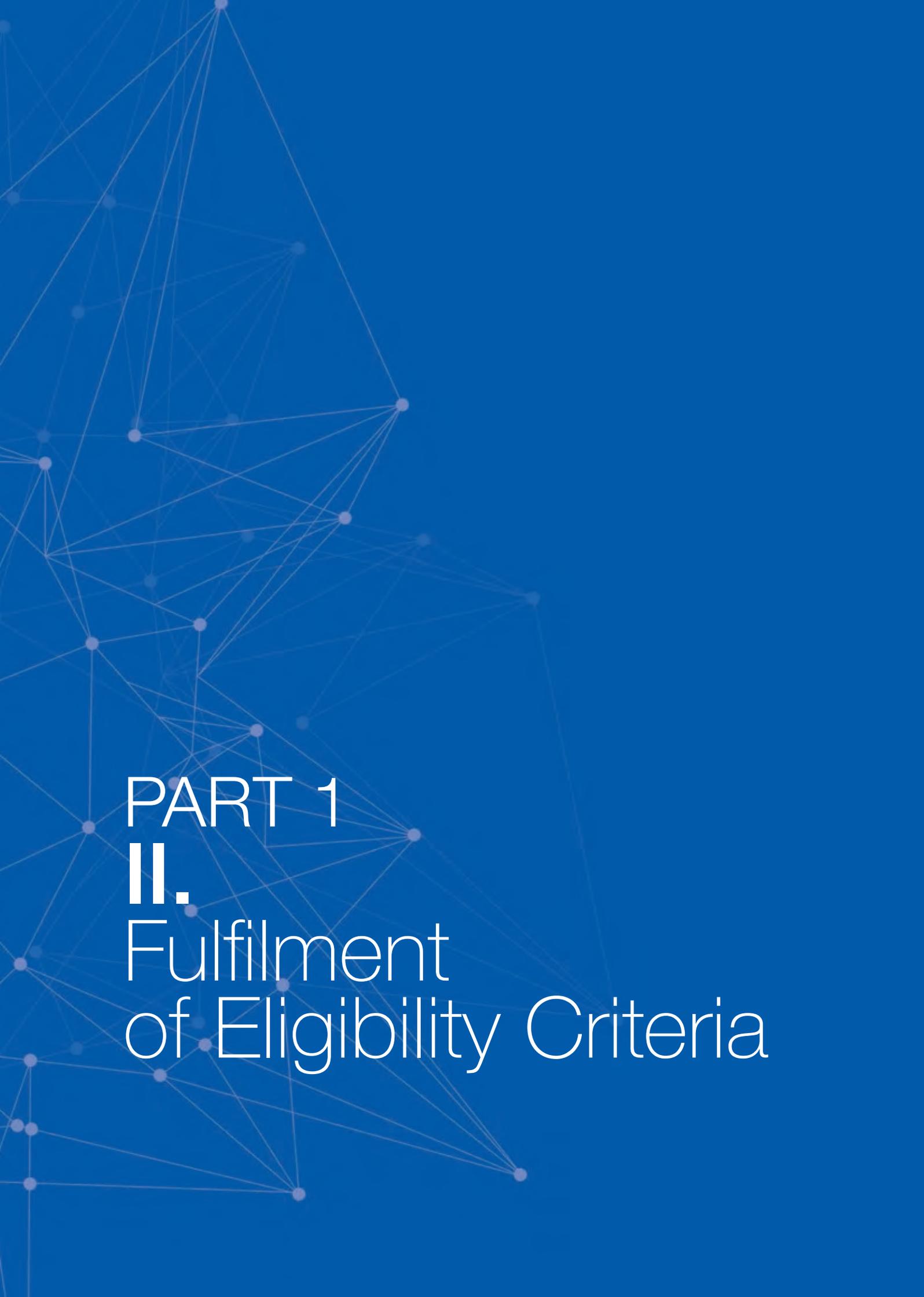
Details of Applicant University / Institution:

Details of Applicant University / Institution:

- i) Name: **Amrita Vishwa Vidyapeetham**
- ii) Address: Amritanagar – PO, Ettimadai, Coimbatore – 641112. Tamil Nadu.
- iii) Location: (Metropolitan / Non-Metropolitan / Non-Urban Area)

Non-Urban Area

- iv) Type of Institution:
 - a) State Private University
 - b) Deemed to be University
 - c) Stand alone Institution
 - d) Institution yet to be established
- b) **Deemed to be University**



PART 1

II.

Fulfilment
of Eligibility Criteria

Part 1. II a

In case of existing private Deemed to be University

I) Whether the Deemed to be University is satisfying all provisions of UGC (Institutions Deemed to be Universities) Regulations, 2016?

No, Details at Annexure 1 Pages a to c

II) Details of notices, if any, issued by UGC or any other Regulatory Bodies?

No such notices are issued

III) Whether MoA & Rules are aligned with UGC Regulations 2016?

Yes, except for those listed in annexure 1

IV) Whether the Institution has filed any Writ Petition in any Court against the Govt/UGC/any other Regulatory Councils? If yes, then give details of the court case.

Yes, Writ Petition # 22097 of 2011, filed in Madras High Court against respondents, UGC and MHRD

V) Whether the Institution has ever been punished under any Act of Parliament or Act of State Legislatures? If yes, then give details thereof.

No

Part 1. II b

Details of the Sponsoring Society / Trust / Company (For existing institutions)

Name of the Sponsoring Society/ Trust / Company:

Mata Amritanandamayi Math

I) Whether Sponsoring Society / Trust is a not-for-profit or Section 8 Company

Not-for Profit

Registration Certificate No.: Doc. No. 9/1988 of Book IV

Date of Registration: 25.01.1988

Registered at: Additional Sub Registrar Office, Karunagappally, Kollam Dist., Kerala

Registered under act: Indian Trust Act

II) Number of Members/Directors

The trust has 7 members

Chairperson: Mata Amritanandamayi Devi

Vice-Chairman: Swami Amritaswarupananda Puri

General Secretary: Swami Purnamritananda Puri

Treasurer: Swami Ramakrishnananda Puri

Trustee: Swami Pranavamritananda Puri

Trustee: Swami Turiyamritananda Puri

Trustee: Swami Amritatmananda Puri

III) Details of other activities being carried out by the Sponsoring Society / Trust /Company

Activities of Mata Amritanandamayi Math

Mata Amritanandamayi Math's humanitarian programs are multifaceted with several goals: to help the needy; to bring in modern technology and to inspire compassion and a sense of oneness with our fellow human beings, whatever their background may be.

Amma teaches that selfless service with compassion is the foundation of all other spiritual practices. She upholds the ancient tradition of charity, where caring for others is the process through which the character of everyone involved is purified. This spiritually inspired approach lends beauty and charm to social welfare.

A quote from Amma's message says it all. 'The beauty and charm of selfless love and service should not die away from the face of this earth. The world should know that a life of dedication is possible, that a life inspired by love and service to humanity is possible'. – Amma

Listed below is a cross section of the humanitarian activities carried out by Mata Amritanandamayi Math

Disaster Relief and Rehabilitation Works

Under Amma's guidance, Mata Amritanandamayi Math has been providing relief and rehabilitation to the victims of a series of natural disasters—earthquakes in Gujarat and Kashmir, floods in Mumbai, Gujarat and Bihar, hurricanes in the United States, the Indian Ocean Tsunami... In the face of these tragedies, Amma's Ashram has provided everything from food, medicine and temporary shelter to new homes, counseling and jobs. Furthermore, the Ashram's provision of emotional succor and long-term support has carried thousands through the darkest periods of their lives into the light of a hopeful tomorrow.

The relief-and-rehabilitation work of Mata Amritanandamayi Math has been praised by government agencies, world-leaders and members of the United Nations as being something 'above and beyond.' It is more than mere relief; it is the care of a mother for her children.

Healthcare

In 1998, Mata Amritanandamayi Math set up Amrita Institute of Medical Sciences (AIMS) which has grown into a 1400 bed super-specialty tertiary-care hospital with Amrita School of Medicine. It has evolved into one of the leading high-tech hospitals in Asia. Medical care at AIMS is available to the common man at an affordable price. AIMS is dedicated to establishing excellence in healthcare through quality preventive care, medical education and research. Amrita lives up to the World Health Organization's new 'universalism', which calls for providing the simplest and most basic quality healthcare for all.

Free Housing Projects for the Poor

Since 1987, Mata Amritanandamayi Math has been constructing houses every year for the benefit of the poor in the vicinity of Amritapuri ashram. In 1996 Amma inaugurated the massive

Amrita Kuteeram project – to build free houses for the homeless and slum-dwellers throughout the country. On May 17, 1998 the Prime Minister of India, Shri Atal Behari Vajpayee, handed over a symbolic key for the first 5,000 houses. By 2002, the initial target of 25,000 homes throughout India had been met. The goal has since been revised to 100,000 houses and to date 47,000 houses have been built and handed over to the beneficiaries.

Spiritual & Cultural Activities

IAM – Integrated Amrita Meditation Technique®

IAM is a simple combination of yoga, pranayama and meditation that takes just 20 minutes a day. It is a meditation technique apt for today's world. The technique is a synthesis of traditional, time-tested methods suited for the current mental conditions, time-constraints and needs of modern man. Amma's disciples teach the technique, free of charge, in all parts of the world.

Amrita Yuva Dharma Dhara (AYUDH) – The International Youth Movement

AYUDH, the International youth movement of Mata Amritanandamayi Math, is active in Europe, North America, Asia, Australia, Africa and India.

AYUDH seeks to empower young people to integrate universal values into their daily lives. Starting with themselves, AYUDH wants to help establish a future of hope, peace and social engagement while maintaining an awareness of spiritual principles

Nature Care

Amma reminds us “The creation and the Creator are not two; it is this principle that informs and motivates the various environmental programs and ‘green initiatives’ of Mata Amritanandamayi Math. For when we see Mother Nature as the embodiment of God, we will automatically serve and protect her.

GreenFriends

GreenFriends is an organization established by the Ashram for the preservation and protection of the environment. Among the several, two main projects undertaken by GreenFriends are:

Amrita Vanam (Amrita Forests): Provides reforestation through the planting of 100,000 saplings every year. 200 greenhouses were established to independently generate these saplings

Harita Theeram (Green Shore): Planting 100,000 casuarina saplings in Alappad Panchayat, Kerala. The casuarina trees not only beautify the shoreline but also protect the beach from erosion.

Amala Bharatam Campaign

Mata Amritanandamayi Math launched this project on 27th Sep 2010. It is a campaign aimed at cleaning India's public places and national highways. Through this cleanliness drive, Amma hopes to raise social awareness of humanity's debt to our beautiful earth and nature.

Amma said that the Math is ready to take up the responsibility of constructing toilets and installing trash cans in government schools and along roads all over India if it has the support and cooperation of state governments and other organizations.

Amala Bharatam Campaign aims to embrace new practical initiatives to clean India,

promote health through hygiene, sort garbage, and properly dispose of waste and make people aware of the need to maintain environmental cleanliness.

Community Marriages

For decades, at the requests of poor families, Amma has been sponsoring the weddings of impoverished couples.

Anna Danam & Vastra Danam

Anna Danam & Vastra Danam (The Gift of Food and Clothing) Amma has established a number of programs to feed and clothe the poor.

Care Homes for the Elderly

The elderly come to Amma's care homes for refuge or to simply spend their final years in a tranquil spiritual environment.

Amrita Nidhi: Free monthly pension for the poor

In 1998, Mata Amritanandamayi Math launched Amrita Nidhi, a project to help destitute women throughout India through the distribution of monthly financial-aid payments

At a time when children are forgetting their responsibilities to their elderly parents, denying them basic necessities such as food and shelter, Amma's compassion has come as a welcome and much needed respite in the form of a monthly pension scheme for impoverished women.

Pensions for widows started in 1998. The physically and mentally challenged and others living below the poverty line as well receiving the financial benefit.

Nation-wide, 59,000 qualified people are now receiving Amrita Nidhi pensions who are struggling to make ends meet. Recognizing that disability or the loss of a family member can consign those in the developing world to a lifetime of hardship, our pensions have no expiration date—they are given for life.

Social Welfare Activities

If one looks closely at the many humanitarian services provided by Mata Amritanandamayi Math, they will see that they are in truth simply an extension of what Amma has been doing since her childhood—taking care of the old, the poor, the neglected, the suffering. There are welfare programs for widows as well as care homes for the elderly; free food, clothing, and homes for the needy; an orphanage; assistance for tribal communities; and post-disaster relief efforts. Not to mention free medical services and hospices.

In recognition of the substantive charitable activities and honouring Mata Amritanandamayi Math's contributions towards making the world a better place to live in, in 2005, Mata Amritanandamayi Math was given the Special Consultative Status with the United Nation's Economic and Social Organization.

Amrita Self-Reliant Villages (Amrita SeRVe)

Amrita SeRVe is a program through which the Mata Amritanandamayi Math (MAM) has selected 101 villages throughout India with the goal of helping them become self-reliant role-model villages for the country.

With the goal of holistic development, Amrita SeRVe is providing assistance to villages in the following focus areas: Self-Empowerment, Health, Agriculture, Eco-Friendly Infrastructure,

Water and Sanitation, Income Generation and Education.

The Mata Amritanandamayi Math—which has had Special Consultative Status with the United Nations Economic-Social Council since 2005—has vast experience in each of these seven areas. Listed below are only some of the activities being undertaken in each area.

1. Health

- Conducting regular medical clinics in the villages where health care is difficult to access.
- Training health workers at the Amrita Institute of Medical Sciences (AIMS), where over 2.6 million people have received totally free medical care since 1998.
- Providing vegetable seeds and educating villagers in home vegetable cultivation. This has been shown to be the most effective mechanism to combat malnutrition.
- Installing filters to provide clean drinking water.

2. Education

- MAM currently provides 46,000 scholarships throughout India through its Vidyamritam program. Now poor children in all villages are receiving these scholarships as well.
- After school tutoring and adult-literacy programs using a multimedia tablet-based learning program called Amrita RITE (Rural Indian Tablet-Enhanced Education).
- Leveraging the Sarva Shiksha Abhiyaan of the Government of India to help upgrade all village schools to Standard XII
- Rural internships for university students. In June 2014, 13 teams of students served in our villages following Amma's call for action first made many years ago.

3. Water and Sanitation

- Rainwater harvesting by educating farmers to make contours and trenches on farms. The former minimize the use of water for irrigation and the latter help recharge groundwater.
- Training AYUDH teams in implementing watershed projects. India is the largest user of groundwater in the world and farmers are the biggest consumers of India's waters.
- Building toilets that use less water. Leveraging the Nirmal Bharat Abhiyaan of the Government of India to empower every family to build a toilet.
- Cleanliness drives and basic recycling education through MAM's Amala Bharatam Campaign, that has been conducting regular clean-up drives throughout India since 2010.

4. Agriculture

- Training farmers in natural farming and organic agriculture practices. Educating them about the harmful effects of using chemical pesticides and fertilizers.
- Developing a model farm at Amritapuri where training can be provided as part of a certificate course from Amrita Vishwa Vidyapeetham in natural farming. The course is modeled after similar courses offered by universities worldwide.
- Starting a seed bank to provide free seeds to farmers. Creating a knowledge repository to enable farmers to know which companion crops to plant and when.
- Providing irrigation facilities so that farmers can grow a second crop after the rainy

season is over to help increase farmer incomes and check migration.

5. Eco Friendly Infrastructure

- The Amrita Kuteeram program has built more than 45,000 houses throughout India. Now in Amrita SeRVE, this program is being extended to villages as well.
- Where possible, the emphasis is on using eco-friendly building technologies such as using compressed mud blocks. Traditional building technologies are also being strengthened.
- MAM has already planted more than one million saplings since 2001. Now as part of Amrita SeRVE, massive afforestation drives are being undertaken in the villages.
- For villages not connected to the grid, Amrita SeRVE is providing options through the solar panels developed at Amrita Vishwa Vidyapeetham.

6. Income Generation

- MAM has already helped more than 100,000 women to form 6,000 self-help groups; now self-help groups are being formed in our villages also.
- Computerized vocational training for fabric painting, artificial jewelry making, etc. is being provided by Amrita Vishwa Vidyapeetham' AMMACHI Labs.
- Leveraging local resources to make value-added products and reviving traditional arts and crafts are the focus of our income generation programs.
- Pensions are being provided to the needy; MAM is already giving Amrita Nidhi pensions to 69,000 widows and physically and mentally challenged people throughout India.

7. Self-Empowerment

- Forming self-reliant groups of especially women and youth in order to tackle problems in all seven focus areas with MAM's help.
- Combating practices such as consuming alcohol, chewing tobacco and eating gutka, by showing videos about the ill-effects of the same.
- Helping bring traditional knowledge about the uses of medicinal plants, rainwater harvesting and natural farming to the forefront and reviving such practices.
- Yoga and meditation camps for the village youth and children. MAM regularly teaches yoga and meditation at its centers, schools and university campuses throughout India.

National : <https://www.amritapuri.org/activity>

International : <http://www.embracingtheworld.org/>

(Details of Credentials of Members / Directors relating to Higher Education / Social Entrepreneurship / academia to be provided) -

*Details are provided in Part 1 Section II -D as this question is duplicated

Part 1. II c

Net worth of Sponsoring Organization: (Details of names of members / proposed members alongwith their net worth to be provided)

All members of the sponsoring organization are Monks of the Puri monastic order of India and practice religious asceticism through selfless service, prayer and contemplation. The rigorous code that governs Indian monastic life also restricts them from accumulation of wealth and possessions.

In accordance with this ancient Indian monastic tradition, the net worth of the members is zero.

Net Worth of Sponsoring Organization

Statement of net worth as on 31 st March 2017	
	Rupees in Crores
Fixed Assets	1712.16
Working Capital	130.38
Sub Total	1842.54
Less Loans (Accounts Payable)	-70.66
Total	1771.88
Reserves and Surplus available as on	2338.09
Net worth of the organization	4109.97

Details of names of members

Chairperson:	Mata Amritanandamayi Devi
Vice-Chairman:	Swami Amritaswarupananda Puri
General Secretary:	Swami Purnamritananda Puri
Treasurer:	Swami Ramakrishnananda Puri
Trustee:	Swami Pranavamritananda Puri
Trustee:	Swami Turiyamritananda Puri
Trustee:	Swami Amritatmananda Puri

Part 1. II d

Details of credentials of members relating to higher education/
Social/Enterperneurship/Academia



Mata Amritanandamayi Devi

Chairperson, Mata Amritanandamayi Math
Chancellor, Amrita Vishwa Vidyapeetham

Other Positions Held

[1981 – Present] Founder & Chairperson,
Mata Amritanandamayi Mission Trust

[1981 – Present] Founder & Chairperson,
Mata Amritanandamayi Charitable Trust

[1981 – Present] Founder & Chairperson,
Mata Amritanandamayi Math

[1998 – Present] Founder, Amrita Institute of
Medical Sciences

[1987 – Present] Founder, Embracing the
World

Awards Bestowed

[2015] Fashion-4-Development “Medal of
Honor,” New York

[2014] Kavithilakam Pandit Karuppan Award,
Kerala, India

[2010] Honorary Doctorate of Humane
Letters, State University of New York, Buffalo

[2010] Dharma Khadgam Award, Pazhassi
Raja Charitable Trust, New Delhi, India

[2007] Prix Cinéma Vérité, Paris, France

[2006] James Parks Morton Interfaith Award,
New York, New York, U.S.

[2006] Philosopher Saint Sri Jnaneswara
World Peace Prize, Pune, Maharashtra, India

[2005] Mahavir Mahatma Award, London,
United Kingdom

[2005] Centenary Legendary Award of the
International Rotarians, Kochi, Kerala, India

[2002] Gandhi-King Award for Non-
Violence, United Nations, Geneva,
Switzerland

[2002] Karma Yogi of the Year, given by Yoga
Journal

[1998] Care & Share International
Humanitarian of the Year Award, Chicago,
Illinois, U.S.

[1993] Hindu Renaissance Award, given by
Hinduism Today

Published Works

- [2014] For My Children,
- [2011] Nectar of Wisdom
- [2011] Amma's Advice: Traditional Wisdom for Modern Times
- [2009] Cultivating Strength & Vitality
- [2008] The Infinite Potential of Women
- [2007] Compassion: The Only Way to Peace
- [2006] Understanding & Collaboration Between Religions
- [2004] May Peace & Happiness Prevail
- [2004] From Amma's Heart: Conversations with Sri Mata Amritanandamayi Devi
- [2002] The Awakening of Universal Motherhood
- [2002] Lead Us to the Light
- [2001] Lead Us to the Light, Volume Two
- [2000] Living in Harmony
- [1999] Eternal Wisdom
- [1997] Eternal Wisdom
- [1995] Unity Is Peace
- [1994] The Eternal Truth
- [1994] Man & Nature
- [1993] May Your Hearts Blossom

Invited International Addresses

- [2015] Keynote address at the UNAI Conference on Technology for Sustainable Development, New York, New York, U.S.
- [2014] Keynote speaker at the Joint Declaration of Religious Leaders Against Modern Slavery, Vatican, Rome
- [2014] Invited address on Compassion, Stanford University, California, U.S.
- [2013] 100 Birth Ann. Celebrations of Sw.

- Vivekananda, New Delhi, India
- [2012] Invited address at United Nations Alliance of Civilizations, Shanghai, China
- [2009] Inauguration of Vivekananda International Foundation, New Delhi, India
- [2008] Inaugurates International Summit of the Global Peace Initiative of Women, Jaipur, Rajasthan
- [2007] Cinéma Vérité Film Festival, Paris, France
- [2006] James Park Morton Interfaith Awards, New York, U.S.
- [2005] Rotary International, Kochi, Kerala
- [2004] Keynote Address at Parliament of the World's Religions, Barcelona, Spain
- [2002] Global Peace Initiative of Women Religious & Spiritual Leaders, United Nations, Geneva, Switzerland
- [2000] Millennium Peace Summit, United Nations, New York, U.S.
- [1995] International Celebrations at the 50th Anniversary of the United Nations, New York, USA
- [1993] Parliament of the World's Religions 100th Anniversary, Chicago, Illinois, U.S.

Chancellor in Global Forums



New York

2015 - Keynote speaker at United Nations Academic Impact

2010 - Honorary Doctorate in Humane Letters from the State University of New York at Buffalo

2006 - James Parks Morton Interfaith Award in New York

2000 - Keynote speaker at the Millennium World Peace Summit, UN General Assembly

1995 - Addresses the Interfaith Celebrations at the 50th anniversary of the UN.

Paris

2005 - Awarded the Prix CinémaVérité for her humanitarian activities and work for peace



London

2005 - Amma receives the Mahavir Mahatma Award



Geneva

2002 - The World Movement for Nonviolence confers upon Amma the Gandhi-King Award for Nonviolence at the UN in Geneva

2002 - Keynote speaker at the Global Peace Initiative of Women Religious & Spiritual Leaders at the UN, Geneva



Shanghai

2012 - Amma addresses United Nations Alliance of Civilizations' Regional Consultations for Asia-South Pacific

Stanford

2014 - Amma participated in Stanford University's "Conversations on Compassion"

Barcelona

2014 - Keynote address at the Parliament of the World's Religions.

2009, New Delhi

Amma inaugurates the Vivekananda International Foundation

2008, Jaipur

Keynote speaker at the Summit of the Global Peace Initiative of Women.

2006, Pune

Receives the Philosopher Saint Sri Jnaneswara World Peace Prize

2005, Kochi

Receives Centenary Legendary Award of the Rotary Club International

Chicago

1998 - Receives the Care & Share International Humanitarian of the Year Award

1993 - Addresses the Parliament of the World's Religions' 100th Anniversary, where is she named President of the Hindu Faith



Vatican

2014 - Amma joins Pope Francis and 10 other world religious leaders in signing of a declaration against human trafficking and slavery.



Swami Amritaswarupananda Puri

Vice Chairman,
Mata Amritanandamayi Math

President,
Amrita Vishwa Vidyapeetham

MA Philosophy,
Trustee, Mata Amritanandamayi Math
Multiple national and international speeches
Invited Address: Cinema Verite, 2007. Paris,
France.

Keynote Address: "Strengthening Europe
through Youth Empowerment, 2014."
Germany.

Published Works

- [1988] Mata Amritanandamayi: Her Life & Experiences of her Devotees
- [1989 - 1996] Awaken, Children! Vol. 1- 7
- [1990] A Biography of Mata Amritanandamayi
- [1996] Smile Within, the Master Bows (Audio Book)
- [1996] Self Surrender Satsang Series (Audio Book)
- [1996] On Fear; Satsang Series (Audio Book)
- [1996] Life & Death; Satsang Series (Audio Book)
- [1996] Learn to Love
- [1996] Smile Within, the Master Bows (Audio Book)
- [1996] Awaken, Children! Volume Eight
- [1998] Awaken, Children! Volume Nine
- [2006] From Amma's Heart
- [2014] The Color of the Rainbow, Compassionate Leadership
- [2015] Mother Of Sweet Bliss

Swami Purnamritananda Puri

General Secretary,
Mata Amritanandamayi Math

Published Works

- [2015] Unforgettable Memories

Swami Ramakrishnananda Puri

Treasurer, Mata Amritanandamayi Math

Published Works

- [2014] The Timeless Path
- [2015] Racing Along the Razor's Edge
- [2014] Eye of Wisdom
- [2014] The Secret of Inner Peace
- [2015] The Blessed Life
- [2015] Ultimate Success
- [2016] Amritashtakam

Swami Pranavamritananda Puri

BSc Zoology, M.A. Sanskrit Literature
Trustee, Mata Amritanandamayi Math

Published Works

- [2015] My Mother My Master

Swami Turiyamritananda Puri

Trustee, Mata Amritanandamayi Math

Published Works

- [1986] Amritadhara, Part I
- [1999] Amritollasam
- [2001] Amritarashmikal
- [2003] Amritattvam
- [2005] Amritadhara, Part II
- [2007] Amritatheertham
- [2008] Amritapadham
- [2009] Bhagavadgita Garimayum Chila Santvanoktikalum
- [2011] Vara Prasadam
- [2013] Gurusishyabhandam Oru Hridayalayanam
- [2014] Amritadhara, Part III
- [2015] Adhyatmadeepti
- [2016] Amritakanthi

Swami Amritatmananda Puri

Trustee, Mata Amritanandamayi Math

Part 1. II e

Details of core team for setting of Institutions of Eminence:

Core Members of IOE

Mata Amritanandamayi Devi

Chairperson, Mata Amritanandamayi
Math
Chancellor, Amrita Vishwa
Vidyapeetham

Swami Amritaswarupananda Puri

Vice Chairman,
Mata Amritanandamayi Math

President, Amrita Vishwa
Vidyapeetham

Swami Ramakrishnananda Puri

Trustee and Treasurer
Mata Amritanandamayi Math

Shri. Abhayamrita Chaitanya

Pro Chancellor,
Amrita Vishwa Vidyapeetham

Dr. P. Venkat Rangan

Vice Chancellor,
Amrita Vishwa Vidyapeetham

Dr. K. Sankaran

Registrar,
Amrita Vishwa Vidyapeetham

Dr. Prem Nair,

Dean, Faculty of Medicine
Medical Director
Amrita Institute of Medical Sciences

Dr. Shantikumar Nair

Dean, Research

Dr. Bipin Nair,

Dean, Faculty of Science

Dr. Sasangan Ramanathan

Dean, Faculty of Engineering

Dr. Somanath V S

Dean, Faculty of Management

Dr. U. Krishnakumar,

Dean, Faculty of Arts
Media and Commerce

Prof. Parameswaran

Director,
Corporate and Industry Relations

Dr. Sankara Chaitanya

Medical Director, School of Ayurveda

Dr. Maneesha V Ramesh

Dean, International Programs,
Head, Wireless and Networks
Applications

Dr. Balakrishnan Shankar

Associate Dean

Dr. Krishnashree Achuthan
Dean, Post Graduate Programs

Dr. Raghu Raman
Chairman, School of Business

Dr. (Col) Vishal Marwaha
Principal, School of Medicine

Prof. Manoj P
Chairman, Department of
Management

Dr. Prema Nedungadi
Head, CREATE Lab

Prof. Bhavani Rao
Head, AMMACHI Lab

Prof. Kamal Bijlani
Head E-Learning Research Lab

Dr. K.P Soman, Head, Center for
Computational Engineering and
Network

Dr. Sriram Devanathan
Head, Center of Excellence in
Advanced Materials and Green
Technologies

Prof. Prashant Nair
Vice Chairman, Internal Quality
Assurance Cell

Shri. Nijamrita Chaitanya
COO

Shri. Sadashiva Chaitanya,
COO

Shri Sudeep
COO

Shri. Dhanraj
COO

Shri Dharmapal
COO

Shri. Srinivas Polisetty
COO

Credentials of the Core Team of IoE

Mata Amritanandamayi Devi

Chancellor,

Amrita Vishwa Vidyapeetham

Spiritual leader and humanitarian Sri Mata Amritanandamayi Devi (“Amma”) is known throughout the world for her selfless love and compassion. Her entire life has been dedicated to alleviating the pain of the impoverished and those suffering physically and emotionally. Amma inspires, uplifts and transforms people from across the world through her loving motherly embrace, her spiritual wisdom and her volunteer organization, Embracing the World (in India, the Mata Amritanandamayi Math).

Since the University’s inception, Amma has stressed the importance of research aimed at humanitarian ends. In her keynote speech at a UN event in 2015 attended by representatives of 90 leading international universities, Amma stated, “Today, universities and their researchers are ranked mainly based on the amount of funding they receive, the number of papers they publish, and their intellectual caliber, but along with this, we should take into consideration how much we have been able to use their research to serve the lowest and most vulnerable strata of society.”

Amma, urged the scientific community to pursue their research with a balance of awareness and compassion, geared to the upliftment of the poor and suffering. Amma’s address focused on the importance of reducing the divide between science and spirituality saying that it has been detrimental to society’s sustainable growth. “These two main branches of knowledge rather than working hand in hand were so disoriented that practitioners were either labeled as modern scientists or representatives of religious faiths.

In our approach to sustainable development, we should not forget that it is by strengthening the people at the base of the pyramid that the entire edifice of society grows healthy and strong.”

This service-motivated research has contributed to Amrita Vishwa Vidyapeetham being ranked as the No. 9 among universities in India by the Central Government of India’s National Institutional Ranking Framework (2017) as well as No. 1 Deemed to be University by the Times Higher Education International Rankings.

Swami Amritaswarupananda Puri
Vice Chairman,
Mata Amritanandamayi Math
President, Amrita Vishwa
Vidyapeetham

Amritaswaroopananda Puri has nearly 40 years experience in overseeing various educational, charitable and humanitarian activities of MAM at the national and international level. An accomplished scholar, speaker, author, lyricist and singer, Amritaswaroopananda Puri has authored several books and has hundreds of musical compositions to his credit.

Swami Ramakrishnananda Puri
Trustee and Treasurer
Mata Amritanandamayi Math

Ramakrishnananda Puri has been actively involved in expanding the spiritual and humanitarian activities of Mata Amritanandamayi Math both in India and abroad for over three decades. A scholar of philosophical and traditional knowledge systems of India, he has authored several books on topics derived from the ancient knowledge of the Rishis.

Shri. Abhayamrita Chaitanya
Pro-Chancellor

B.Tech from NIT Kurukshetra

- Spearheads the administration and growth of Amrita Vishwa Vidyapeetham
- Actively involved in national reconstruction and rehabilitation efforts in the wake of disasters

Dr. K Sankaran
Registrar

Ph. D. from the Indian Institute of Science, Bangalore (India)

Professor, Chairperson, Principal, and an Academician at Amrita Vishwa Vidyapeetham and TKM (India)

- Oversaw two NAAC accreditations of the campus with both of them yielding an A grade

Dr. P Venkat Rangan
Vice-Chancellor

Ph.D. in C.S from UC Berkeley

16+ years as Professor of Computer Science and Engineering at UC San Diego

- 75+ peer-reviewed publications
- 20 US Patents
- Founder of Multimedia Laboratory and Internet & Wireless Networks (WiFi) Research at UC San Diego (USA)
- Founder of Yodlee
- Fellow of ACM

Dr. Prem Nair
Medical Director, AIMS

Doctor of Medicine (D. M.) from UC Southern California (USA)

Founding Medical Director at Amrita Institute of Medical Sciences
Chairman at Hospital of Good Samaritan-Los Angeles (USA)

- Holds the office of the President of Association of Healthcare Providers (India)

Dr. Shantikumar Nair
Dean, Research

Ph.D. in Materials Science and Engineering
from Columbia University

20+ years as faculty of the Mechanical
Engineering Department of the University
of Massachusetts

- Received the Presidential Young Investigator Award from President Ronald Reagan for research in composite materials
- Received the MRSI Medal in Feb 2009 for outstanding contributions in the field of Materials Science
- National Research Award from the Government of India
- Received the C N R Rao India Nanosciences Award for outstanding contributions in Nanotechnology Research and Development in India

Dr. Bipin Nair
Dean, School of Biotechnology

Post-doc from University of Tennessee
Ph.D. in Microbiology from University of
Baroda

11+ years as Research Manager and Senior
Scientist at MDS Pharma Services

- 150+ peer-reviewed publications
- 3 US patents, 2 Indian patents
- Associate Editor for the International Journal Current Pharmacogenomics and Personalized Medicine
- Recipient of Bill and Melinda GATES Foundation – BIRAC Grand Challenge Award

Dr. Sasangan Ramanathan
Dean, Faculty of Engineering

Ph.D. in Chemical Engineering from
Clarkson University (USA)

13 years at AIXTRON, Inc. (USA) as Chief
Technology Officer, Vice President and
Director

- 45+ publications in international journals and conferences
- holds 12 patents
- served on the International Technical Advisory committee in the American Vacuum Society's topical conference on Atomic Layer Deposition
- active member of the advisory committee of topical conferences in Electrochemical Society and American Chemical Society
- chaired several international conference sessions

Dr. Somanath V S,
Dean, Faculty Management

Ph. D. (New York University)
M. Phil. (New York University)
M. B. A. (New York University)

Thirty years plus of academic experience,

- Published in recognized US academic journals such as the Journal of International Business Studies, Journal of International Money and Finance and the Journal of International Financial Markets, Institutions and Money.
- Worked briefly for the United Nations (Center for Transnational Corporations) in New York.

Dr. U. Krishnakumar
**Dean, Faculty of Arts,
Media and Commerce**

Ph. D. from IIT-Mumbai

M.E. in CS from I.I.Sc., Bangalore

He has 39 years academic experience and 21 years research experience in India and abroad.

- Dean, Faculty of Arts, Media and Commerce. Also serves as Chairman (Board of Studies), Director & Research Supervisor in the Department of Computer Science and I.T., School of Arts & Sciences, Kochi

Prof. Parameswaran
**Director, Corporate and Industry
Relations**

Graduate in Aeronautical Engineering
Trained in British Aerospace U.K and
A.M.D & B.A, France

40+ years in Quality Assurance in
Aeronautical industry and Education
Management

- Recipient of National Aeronautics Prize for contribution to Advanced Light Helicopter project
- Life member of Aeronautical society of India (MAeSI)
- Life Member Indian Society for Advancement of Materials and Process Engineering (M.I.SAM.P.E)

Member National Technical Committee for
MIRAGE A/c MRO

Dr. Balakrishnan Shankar
Dean, Faculty of Humanities

Ph. D., University of Texas, Austin, USA
B. Tech in Mechanical Engg from IIT-BHU

He currently serves as Associate Dean,
and the Chairperson at the Dept of
Mechanical Engineering at Amrita School of
Engineering, Amritapuri

- Research in Materials Science

Dr. Krishnashree Achuthan
Dean, Post Graduate Programs

Ph.D. in Chemical Engineering from
Clarkson University

8+ years at Advanced Micro Devices, Senior
Member of Technical Staff, Advanced
Product Development Group, Sunnyvale, CA

- 30 U.S. Patents
- 50+ peer-reviewed publications
- Recipient of Best Incubator Award from President of India
- IEEE Senior Member
- PI, Amrita Virtual Labs

Dr. Raghu Raman
**Chairman, School of Business,
Coimbatore**

Ph.D in Management, Amrita Vishwa
Vidyapeetham (India)

MBA from Haas School of Business,
University of California Berkeley (USA)

10 years as Executive Director at IBM 4
years as Entrepreneur-in-Residence at NEC
Research Labs and 5 years as COO of Amrita
Technologies

- Established the CREATE@Amrita
- 45+ publications
- Member, Standing Committee, NMEICT, GoI
- Board of Directors, Amrita TBI
- Advisory Editor, Journal of Educational Technology & Society

Dr. (Col) Vishal Marwaha
Principal, School of Medicine

M.D. from Pune University - Armed Forces
Medical College (India)

25+ years in the Indian Army as a Medical
Specialist and Senior Advisor, Headed Indo
Bhutan Friendship Hospital, Thimpu, Bhutan

- 12 indexed publications in Pubmed
- Awarded Manakkal Silver medal (MD General Medicine)
- Awarded Chief of Army Staff Commendation
- Awarded General Officer Commanding – in – Chief Commendation twice
- Awarded young investigator Award in Nagasaki, Japan

Prof. Manoj P.
Chairman,
School of Business, Bengaluru

MBA in IT Management from University of Surrey (UK)

Masters in Information Systems from NTU (Singapore),

13 years in the Singapore Navy as Naval Officer and Captain, specializing in Electronic Warfare

- 15 years of international work experience in the IT industry (Singapore, UK, Australia)
- Certified Information Systems Auditor (CISA)

Dr. Prema Nedungadi
Head, Center for Research in
Analytics and Technologies for
Education

Ph.D. from Amrita Vishwa Vidyapeetham (India)

12 years of software architecture experience at IBM, Sybase Inc. and Clairon Tech. (USA)

- 60+ peer-reviewed publications
- - Recipient of Digital India Recognition from MeitY, GoI
- (eGovernance Category)
- - Presentations at UNESCO & Vatican for mobile learning &

- Rural Education in 21 Indian States.
- Advanced in Barbara Bush Foundation XPRIZE, USA Adult Literacy Challenge

Prof. Bhavani Rao
Head, Center for Women's
Empowerment and Gender Equality

Director, AMMACHI Labs

UNESCO chair in Women's Empowerment and Gender Equality

- Principal Investigator for several projects funded by the UN Democracy Fund and the MHRD, Government of India
- 4 US Patents

Prof. Kamal Bijlani
Head, E-Learning Research Lab

MS in Computer Science Michigan Technological University 1984

Architect of A-VIEW, (Virtual Classroom Platform for India.

Research and development in artificial intelligence and educational Technologies in startup companies from MIT and Stanford USA ; 12 years (USA

- 50 publications
- 2 patents
-

Dr. K.P Soman
Head, Center of Computational
Engineering and Network

Ph.D from IIT, Kharagpur

Head and Professor at Amrita Center for Computational Engineering and Networking (CEN

- 3 Books
- 1 Chapter
- 50 Journal Articles
- 50 Conference Papers

Part 1. II f

Proposed Corpus fund (for brown field Institutions)

Net worth of Sponsoring Organization

- i) **Initial corpus fund:** Rs. 60 Crores
- II) **Final corpus fund to be achieved in ten years:** Rs. 150 Crores
- III) **Guaranteed pipelines:** Rs. 500 crores, surplus as per balance sheet
- IV) **Additional Resources:** Rs. 500 crores, surplus as per balance sheet. If required institution will avail a loan

Details of source of funds is provided in Annexure 2

Part 1. II g

Governance structure:

i) Composition of Apex Governing Body of Institutions of Eminence

Board of Management

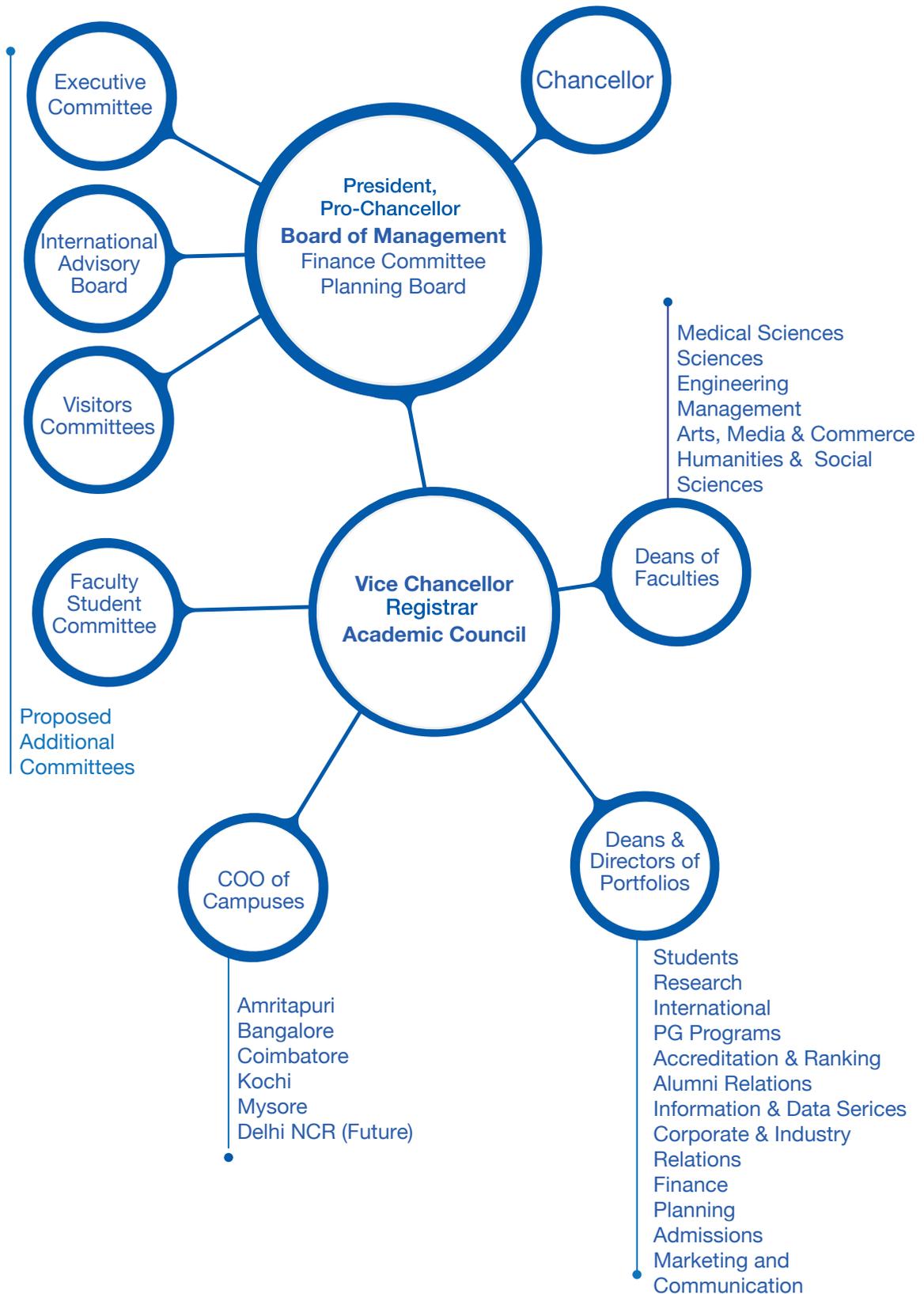
- 1) Mata Amritanandamayi Devi (Chancellor)
- 2) Swami Amritaswarupananda Puri (President)
- 3) Swami Ramakrishnananda Puri (Member)
- 4) Brahmachari Abhayamrita Chaitanya (Pro-Chancellor)
- 5) Dr. P. Venkat Rangan (Vice-Chancellor)
- 6) Dr. Prem Nair (Dean, Faculty of Medical Sciences)
- 7) Dr. Bipin Nair (Dean, Faculty of Sciences)
- 8) Dr. Shantikumar V. Nair (Dean, Research)
- 9) Dr. U. Krishna Kumar (Dean, Faculty of Arts, Media & Commerce)
- 10) Dr. K. Sankaran, Secretary (Registrar)

International Advisory Board

- 1) Dr. Leland H. Hartwell
International Advisor for Faculty of Medical Sciences
2001 Nobel Laureate
- 2) Dr. Satish K. Tripathi
International Advisor for Faculty of Engineering
President of the University at Buffalo (UB),
- 3) Dr. Suresh Subramani
International Advisor for Faculty of Sciences
Former Executive Vice Chancellor for Academic Affairs and a
Distinguished Professor of Molecular Biology at the UCSD
- 4) Dr. Jagdish Sheth
International Advisor for Faculty of Management
Charles H. Kellstadt Professor of Marketing | Emory University,
Goizueta Business School, Atlanta, GA, US
- 5) Dr. Jeffrey D. Sachs
International Advisor for Faculty of Humanities & Social Sciences
Economist, University Professor, at Columbia University, New York.
Special advisor to the UN Secretary-General on Sustainable Development

ii) Governance Structure of proposed Institution of Eminence

Amrita Vishwa Vidyapeetham - Governance Structure



Details of credentials of members along with their relationship with Sponsoring Organization

Only the following members of the Governing body are from the Sponsoring Organization(Mata Amritanandamayi Math)		
Name	Designation with respect to Sponsoring Organization	Designation with respect to Institution of Eminence Governing body
Mata Amritanandamayi Devi	Chairperson	Chancellor
Swami Amritaswarupananda Puri	Vice-Chairman	President
Swami Ramakrishnananda Puri	Treasurer	Member

Part 1. II h

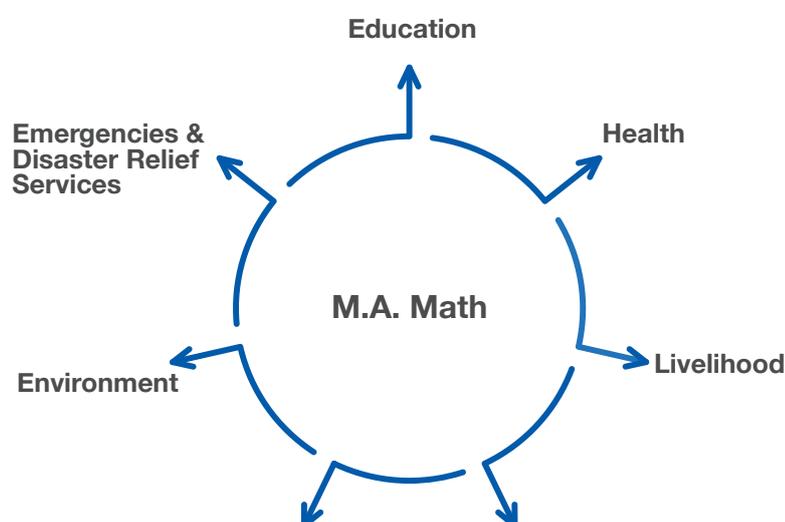
Evidence of experience in translating plans into real achievements in any field in any sector preferably in education sector:

Mata Amritanandamayi Math: Supportive Trust for Amrita Vishwa Vidyapeetham

Humanitarian & Charitable Initiatives Overview

The Mata Amritanandamayi Math (MAM) was born of a humble Ashram that rose from a poor fishing village in south Kerala in 1981. Born in that same village, Mata Amritanandamayi, Amma, is now one of the most recognized global Spiritual and humanitarian leaders, whose life is utterly dedicated to uplifting the world. Under her guidance the MAM has blossomed tremendously, and is known worldwide for the sheer breadth, depth, and effectiveness of its multitude of charitable and humanitarian works.

The MAM conceived of, and now runs, one of the world's largest NGOs (Non Governmental Organization), Embracing the World (ETW). ETW is a global network of regional humanitarian organizations inspired by Amma's mission to help alleviate the burden of the world's poor through helping to meet each of their five basic needs: education, food, shelter, healthcare, and livelihood, including in the aftermath of major disasters. Augmenting these efforts, it works in the fields of environmental conservation and global sustainability. We believe that having these needs met is the fundamental right of every human being, and that it is the responsibility of each of us to strive hard to ensure that one day, everyone can live in dignity, safety, security and peace. Some of the ways the MAM has contributed to societal needs are noted here:



Education

MAM's Compassion-Based Outreach Activities support education established upon a core of higher spiritual values, and are realized through various avenues. From primary, secondary, higher, and social educational initiatives designed to uplift all including the poorest sectors of society, the MAM has impacted an estimated 6.7 million children and adults throughout India, a large percentage being the rural poor. There are numerous award-winning educational innovations developed by the MAM, only a very few of which are noted here.

Amrita Vidyalayams:

Value Education for Young Minds. Firmly believing that high spiritual values should be inherent in education in order to inspire future world citizens of integrity, compassion, and leadership, the first Amrita Vidyalayam was inaugurated in 1987 as part of MAM's mission to uplift the world. Today there are 65 Amrita Vidyalayams, teaching from class 1 through 12, throughout India. These 'values-based' primary and secondary schools offer academic excellence, life skills, vocational training, and 21st Century Skills Training education throughout India. Modern learning tools are used, including multimedia, audio, video, and internet, impacting 6,49,188 children to date.

The highest excellence in education offered by Amrita Vidyalayams is reflected in high quality awards won by our students in national and international competitions, a few of which are mentioned here:

- **IRIS Challenge:** Amrita Vidyalayam, Davangere won the IRIS 2012 Grand Award in the Senior Category for their project 'Vaina's Square Lemma: Food

Extension of Pythagoras Theorem on Division of Equal Squares'. They were among the 10 students to represent India at International Science and Engineering Fair held in May 2013, in Phoenix, Arizona, USA.

- **OLabs (Online Labs):** Amrita Vidyalayams across the country employ digital learning technologies developed by Amrita. An example is CBSE endorsed Online labs, virtual lab experiments that make use of cutting edge simulation technology to create real world lab environments.
- **Atal Tinkering Labs:** Amrita Vidyalayam Chennai and Amrita Vidyalayam Thalassery were two of the 10,000 applicants to receive the prestigious NITI (National Institution for Transforming India) Aayog grant to set up Atal Tinkering Labs at their schools as part of the GoI Atal Innovation Mission.
- **INSPIRE Camp 2012** (Innovation in Science Pursuit for Inspired Research): Amrita Vidyalayam students were active participants in the Department of Science and Technology (DST), GoI, INSPIRE Camp 2012,, organized by Amrita aimed at attracting talented minds in the country to the field of science. Top students at Amrita and more than 45 other reputed schools interacted with eminent scientists and mentors, such as Nobel Laureate, Dr. Lee Hartwell

Higher Education Initiative Amrita Vishwa Vidyapeetham

In addition to developing 65 Vidyalayams, the MAM's dedication to advancing educational excellence with higher values at the core, led to the creation of an Engineering School in 1994. The small school was tucked within an

obscure village situated among the foothills of the Western Ghats in Tamil Nadu. With phenomenal growth over the years, Amrita currently spans over more than 1000 acres across five campuses in three states, and has building space of about 9 million square feet. From its humble beginnings with 120 students and 13 faculty, Amrita presently educates 18,433 energetic students and has 1688 quality faculty (about 35% PhD status), offering a Faculty Student Ratio of 1:10.9, the best prevailing in India.

Within 14 years the MAM has developed Amrita into a university offering more than 200 UG, PG and PhD programs. Amrita enthusiastically strives for, and gives paramount importance to, the highest pedagogical advancements, the most innovative, pioneering research initiatives contributing to human and environmental wellbeing, and to promoting the most treasured spiritual principles from ancient Indian culture to shape students into successful, virtuous, and confident global leaders of tomorrow. Students successfully compete at national and international events and prove themselves to be on par with many of the world's top universities. Since 2012, faculty and students have published nearly 5,200 papers in Scopus preferred journals and conferences.

When declared a deemed to be University in 2003 by the NAAC, we were the first in India to receive this recognition with a multi-campus, multidisciplinary foundation already in place. Six years later Amrita was also the youngest institution to be awarded with an 'A' grade by the National Assessment and Accreditation Council (NAAC). With the MAM's support, Amrita has leapt the ladder of university rankings such that today it stands among the top 500 universities in the world in the area of Clinical, pre-clinical, and health, according to the THE World University Rankings.

Other Educational Initiatives

- Providing values-based education to more than one lakh students at 75 institutions across India,
- Award-Winning Adult Education: Helping tribal populations achieve Fair Trade through literacy
- More than 50,000 scholarships worldwide (goal=100,000), keeping children in school in India, Japan, Haiti, Philippines, Singapore, Malaysia, and Spain
- Vidyamritam Scholarship for education started in 2008 in response to farmer suicides- 51,000 given to date
- After-school tutoring for tribal children and slum-dwellers
- Schools for the differently-abled and schools for hearing impaired
- Provide scholarships, literacy via tablet technology, & tutoring for 101 villages across India
- **The Jan Shikshan Sansthan (JSS)**- Institute Of People's Education has been launched by the Government of India for the poorest sections of society, particularly the Tribal villages. Amrita runs this program in the districts of Idukki (Kerala) and Sivakasi (Tamil Nadu). The program offers:
 - Tribal Children Education - School Levels
 - Tribal Adult Education - Vocational Training
 - Tribal Adult School to University Level Programs
 - Self Help Group Training for Entrepreneurship

Additional MAM Initiatives for the World's Impoverished

Basic Needs

Health

- Providing values-based education to more than one lakh students at 75 institutions across India,
- Award-Winning Adult Education: Helping tribal populations achieve Fair Trade through literacy
- Constructing 2,000-bed Amrita Hospital in Delhi NCR
- Five satellite charitable hospitals
- In total, Mata Amritanandamayi Math has provided totally free care to more than 43.3 lakh people since 1998
- Cancer hospice in Mumbai and clinic for people with HIV & AIDS in Trivandrum
- Cataract Surgeries, White Canes for Blind Children and Medical Camps in Kenya
- Treating Preventable Blindness in Mexico
- Organ Transplants for People in Poverty
- Train health-workers and to conduct medical clinics at 101 villages throughout India.
- **Amrita Institute of Medical Sciences (AIMS):** Recognizing a dire need in India for the availability of quality healthcare for millions of impoverished persons, in 1998 the MAM opened a 100-bed hospital in Kochi, Kerala with two primary aspirations: to provide top quality care, at affordable cost or without payment, to impoverished

persons. AIMS, like the university, grew both in size and in the premier, impressive excellence of its services, treatments, and research. To date, the hospital has provided totally free medical care to more than 4.33 million patients, at the value of more than \$95 million in charitable care. It is now a 1450 bed, high quality hospital with recognized Schools of Medicine, Nursing, Dentistry, and Pharmacology. More on AIMS can be found in the section about Amrita Vishwa Vidyapeetham.

Livelihood

- Empowering one lakh women via start-up capital, vocational education and access to microfinance opportunities with government-regulated banks
- Pensions for one lakh people including widows, impoverished women, and the disabled
- Traditional Arts School and Industrial Training Centre
- Vocational Training Centre in Nairobi gives young adults tools to break free from poverty
- Training women to build toilets for themselves and their communities
- Computerized vocational training and life-enrichment education for thousands of women annually via more than 30 Centres throughout India, as well as through our 101 villages program.

Shelter

- Constructed more than 47,000 homes for the homeless in 75 locations throughout India
- Relocation of slum-dwellers into 1,600 clean, new apartments in Pune and Mumbai

- Orphanage for 500 children in Kerala and children's home serving more than 150 in Nairobi
- Four care-homes for the elderly in India
- Providing new clothing for more than four lakh people in poverty annually
- Provide proper homes, community Centres and street lights in 101 villages throughout India.*

Food

- Feeding 1 crore people annually in India; distributing milk, rice and other items to tribal areas
- Amma's Kitchen in 50 cities serves more than 1.5 lakh people annually in North America
- Feeding-the-hungry in Mexico, Costa Rica, France, Spain, Kenya, Brazil, Slovenia, Australia
- Provide clean drinking water and sustainable agricultural solutions for 101 villages in India.

Environment

Health

- Donated Rs. 100 crores to the Namami Gange -- Clean the Ganges Project (2015)
- Rs. 100 crores worth of toilet construction and other environmental efforts in Kerala
- 10,000 toilets built in rural India
- Member Organization of the UN Billion Tree Campaign: over 10 lakh trees planted worldwide
- Innovative waste management with comprehensive recycling and composting at institutions
- Environmental Awareness Campaigns,

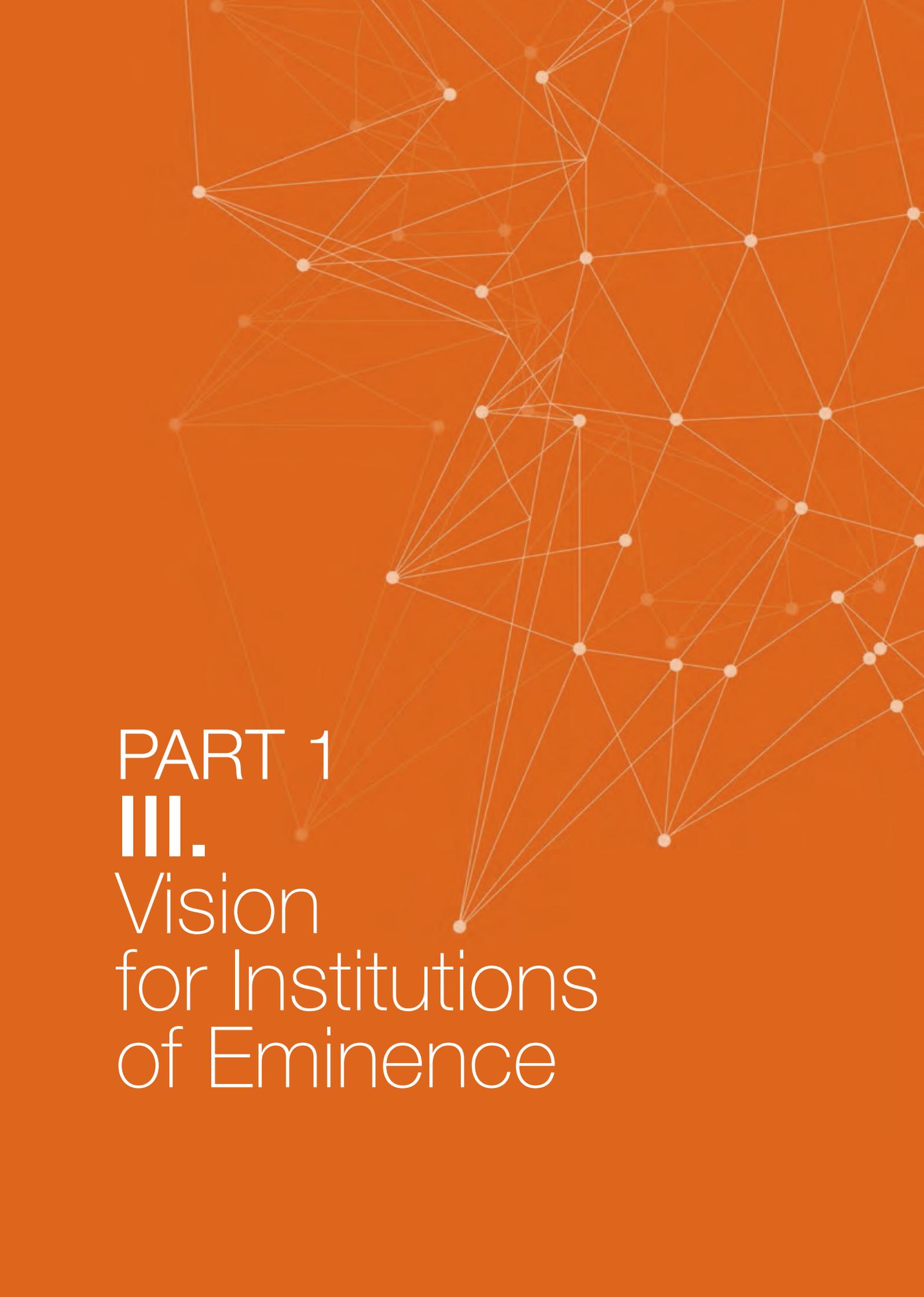
including the online InDeed Campaign for Nature

- Supporting 10,000 impoverished people to grow organic vegetables on their own land
- Sustainable Communities: Harmonizing with nature through beekeeping, permaculture, rainwater harvesting, improved agricultural and irrigation methods, eco-building, & other conservation techniques at our Centres worldwide

Part 1. II i

In case, the Institution is established under a law passed by a Legislative Assembly of a State, an undertaking from the State Government to the effect that if the University is selected as an Institution of Eminence

Not Applicable



PART 1
III.
Vision
for Institutions
of Eminence

Part 1. III a

Fifteen-year Vision Plan including Mission Statement, Values, Institutional Goals & Vision to meet the objectives and Characteristics of an Institution of Eminence with quantified milestones and timelines to achieve world class repute as expected in the Regulations.

Message from the Chancellor

“True education helps us to find and fulfil our purpose in life. Through education, new horizons will open up in the highest realms to those thirsting for knowledge - especially students, teachers and researchers. Today, universities are ranked primarily based on the amount of funding received, papers published, and their intellectual calibre. However, we should also take into consideration how their research has been able to serve the lowest and most vulnerable strata of society.

Whether or not God exists might be a source of debate, but no rational person can ever say that suffering humanity does not exist - we can see that suffering with our own eyes. In my view, service to such people is worship of God. Youth should be made aware of the importance of cultivating the age-old spiritual values such as love, service-mindedness, humility and the importance of giving back to society, the fruit reaped from one's success. Unfortunately, the modern system of education does not give importance to this.

At Amrita, all our students, are encouraged to go to impoverished rural villages or city slums for at least one or two months during their education. In this way, they are able to see for themselves the problems faced by the poor. We then have them develop and deploy solutions to those problems and write papers about it. This not only uplifts the downtrodden but also awakens compassion and service-mindedness in the students. My wish is that similar programs are incorporated into all universities throughout the world.

Humankind should develop the expansiveness to embrace both scientific knowledge and spiritual understanding, and to use science and technology to help the poor and suffering. We can no longer afford to view these two streams of knowledge as flowing in opposite directions. In truth, they complement one another. If we merge these streams, we will find that we are able to create a mighty river—a river whose waters can remove suffering and uplift humanity.

May this great river of knowledge flow to caress the countries and communities of the world. May it overflow borders between people and countries. May it impart the water of life to all of humanity, and thus nurture the blooming of culture throughout the world.”

- Mata Amritanandamayi Devi

Our Vision

Our vision is to be an exemplary Institution that thrives from its commitment to the transformative power of value based education, endowed with technological and pedagogical initiatives, with a special emphasis on health and well-being, that provide the impetus for goal-oriented research for societal benefit and a motivated educational journey, towards a harmonious, prosperous and sustainable future.

Our Mission

Our mission is based on the foundation of three primary principles:

Education for Life

Compassion Driven Research

Global Impact

Education for Life

There are two types of education: education for living and education for life. Studying to become a professional is education for a living. On the other hand, education for life requires an understanding of the essential human values. At Amrita, we believe that education should also impart a culture of the heart, based on enduring values and inner strength.

Compassion Driven Research

Our motivation to pursue research originated from seeing the suffering around us – poverty, starvation, sickness, environmental pollution and contamination. We believe that if we could transform compassion from a mere word into a path of action, we would be able to solve most of the world's problems.

If we take this step courageously, then our research and its outcomes will have a special beauty, spontaneity, and power. At Amrita, we strongly believe that the culmination of all research should be societal benefit.

Global Impact

At Amrita, we stand united in our mission towards solving globally recognized scientific and societal challenges, including environment, development, and health. Amrita stands at the strategic juncture of two streams of cultures: East and West. It is our vision to bring the two together to bridge the divide through meaningful collaborations with world class universities and innovative approaches that will benefit the entire planet.

Our Values

Amrita's culture of education equips students to be rooted in the values of Dharma (righteousness), Karuna (compassion) and Shraddha (mindfulness). Endowed with qualities of acceptance, patience, self-confidence, perseverance and enthusiasm, the benefit of humanity will become uppermost in their thought, word and action. They will then pioneer innovative solutions for the benefit of all humankind, leading to sustainable health and prosperity for all. This resonates with the ancient Sanskrit prayer 'Lokah Samastah Sukhino Bhavantu'. It is a reminder of our deeper connection to the entire world around us, "May our work contribute to the happiness of all beings."

Our commitment to faculty and students

The stakeholders of our university are primarily faculty and students. The students are our next generation who can build the future of our nation and the world. We present our institutional commitment to our students and faculty as we aim for the IoE.

To have our students excel in academics and research and enter top 500 universities as permanent faculty

- Research and Innovation at all levels including undergraduate level
- Interdisciplinary academics and research
- Exposure to humanities and management concepts and ideas for all students

To provide faculty with outstanding facilities and environment to excel as world reputed research faculty (become members of scientific academies in the world and publish in very high impact journals)

- Faculty Mentoring Programs at International Level (eg., Mentoring by Nature Editors)
- Develop world class research laboratories in interdisciplinary areas
- Textbook writing program and support

To enable our faculty and students to bring out successful and affordable products into the society by translation from academics/research to practice and application so that there can be a large impact on people.

- Translational Research Emphasis
- Business plans and market Analysis focus in research

To enable our students and faculty to contribute to our nation's industry by providing high quality research support to industry

- University Industry Strategic partnerships in academics and research

To have a good percentage of our students placed in high positions of impact (top 500 companies in India or top 1000 companies in the world)

- Student mentoring and training for competitive job market
- University industry strategic partnerships
- Strategic Global curricula development
- Non Traditional Teaching Learning Initiatives

Institutional Goals to meet the Objectives and Characteristics of IoE

Amrita Vishwa Vidyapeetham aims to become an Institution of Eminence by satisfying the stipulated objectives and characteristics through a comprehensive set of goals. We have grouped these goals under the following broad heads: Global Recognition, Research Excellence, Academic Excellence and Societal Impact. We have further divided these broad goals into subgoals, for each of which, we present a universally accepted quantifiable measure as well as our 15 year target.

Institutional Goals	Sub Goals	Parameters	Present Status	Target for 10 th Year	Target for 15 th Year
Global Recognition	Global rankings	THE World University Rankings	800-1000	400-500	300-350
	Attract world class faculty	% Foreign faculty	10%	20%	30%
	Attract international students	% Foreign students	2%	15%	25%
	International Collaboration	Total no. of collaborations with top 500 ranked universities	59	150	200
Research Excellence	Innovation	No. of patents granted per year	5	20	30
	Faculty publications productivity	Papers per faculty per year	0.6	2	2.5
	Faculty research quality	Citations per paper per year	3.5	7	9
	World class lab infrastructure	Built-up lab space (in sq. ft.)	3 Lacs	5.4 Lacs	7 Lacs
Academic Excellence	Quality of teaching	% Ph.D. holders	47%	90%	100%
	Teaching effectiveness	Faculty Student Ratio	1:12	1:10	1:10
	Academic innovation	% Interdisciplinary courses offered	12%	50%	50%
Social Impact	Building self reliant villages - water & sanitation, energy, health, education, agriculture, infrastructure and employment.	Villages adopted in India	22	75	101

The detailed strategy by which we plan to accomplish the above goals and targets is presented in Part 1. Section III c.

Part 1. III b

How far is the Institution/ University from becoming an Institution of Eminence, including the present status of the institution, the status which seek to achieve to become as world class and gap in each parameter as given in Regulation 4.2 & 4.3

Present Status: Growth and Rankings

Amrita Vishwa Vidyapeetham was granted Deemed to be University status by UGC in 2003 at which time we had only 1,260 students and 200 faculty. Today we are educating a vibrant student population of over **20,200**, 1700 faculty, offering more than **250 UG, PG, and Ph.D.** programs in Engineering, Management, Medical Sciences (including Dentistry, Pharmacy, Nursing, Medicine), Arts & Humanities, and Social Sciences. With campuses at Coimbatore, Amritapuri, Kochi, Bangalore, and Mysore. Amrita is emerging as one of the fastest growing institutions of higher learning in the country. In the **short span of 14 years**, we have established **27 collaborations** with **top 100 world ranked** universities.

Today we are ranked in the **Top 500** in THE World University Rankings for area of Clinical and Health, 2018 and **Top 500** in **THE World University Rankings** for International Outlook and Industry income. In **QS Asia University Rankings 2018**, Amrita is ranked as No.1 Private University in India. Moreover, Amrita has international faculty ratio score of 25.6, while the regional average is only 8.9. This makes Amrita No. 1 in India on this key parameter, even ahead of IITs and Central universities. On the parameter of faculty with Ph.D., we scored an impressive 71 compared to the regional average of 64. Additionally, with our focus on high-quality research, Amrita scored 4.9 for citations per paper, while the regional average is 4.7.



Top 500 in
Clinical and Health, 2018

Top 500 in
International Outlook,
Industry income 2018



NO.1 Private University
in India, 2018



Considering there are approximately 11,900 universities regionally,
this makes Amrita in the top 1.4% of all universities in Asia.

Top 200 in
BRICS & Emerging
Economies, 2017



Top 200 in BRICS
NO.1 Private University
in India, 2018

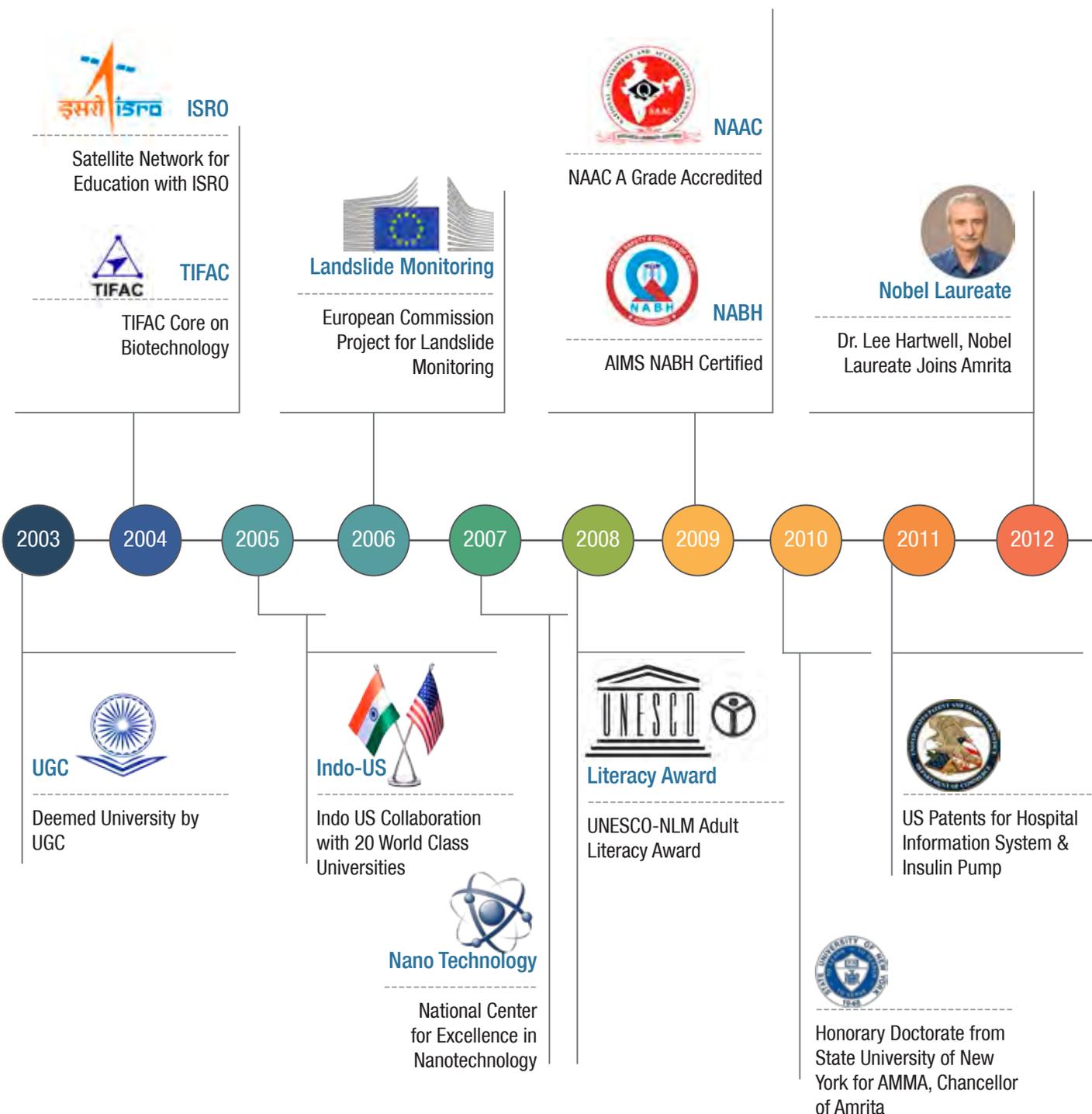


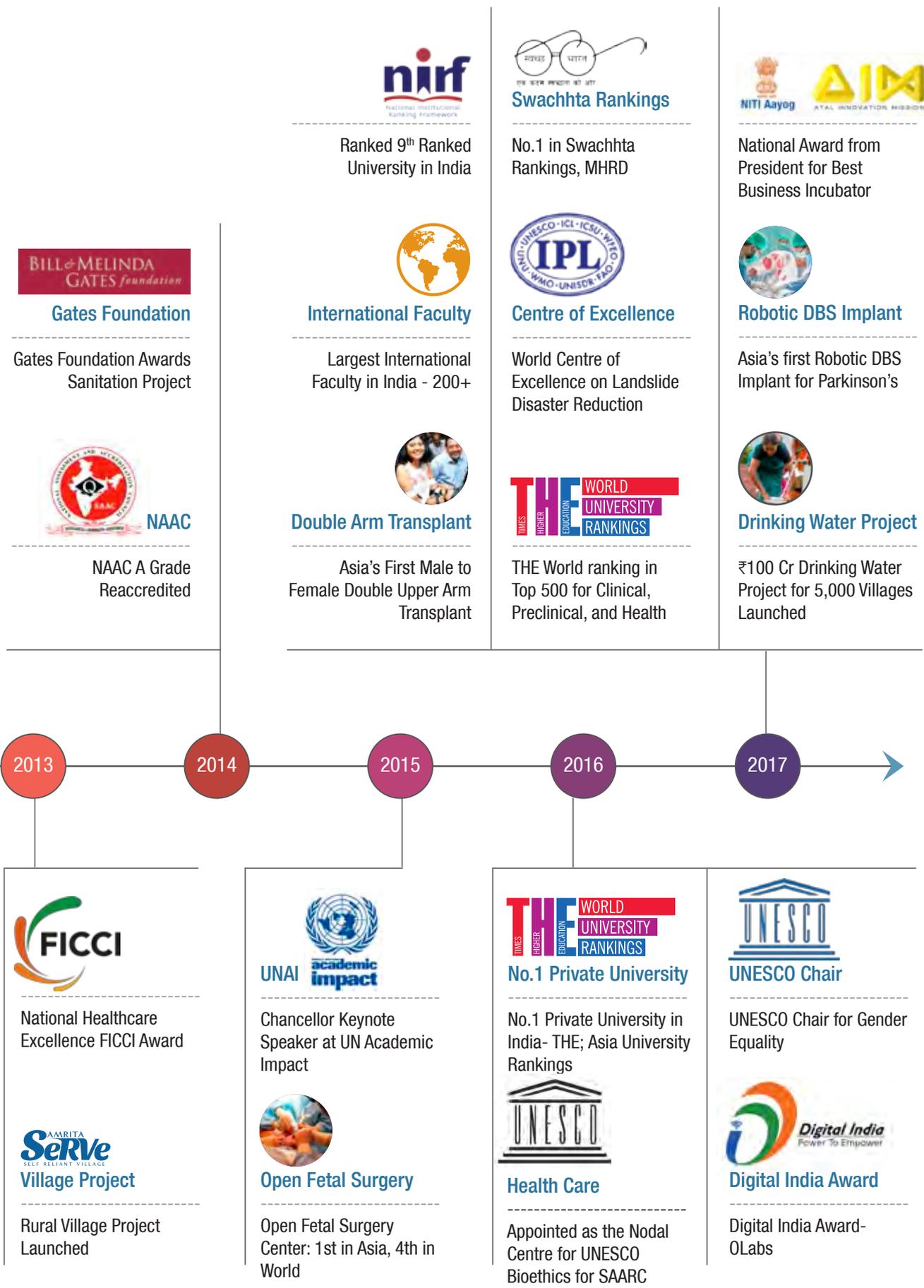
Amrita is ranked 9th among all universities
in the National Institutional Ranking
Framework (**NIRF**) 2017 ranking by

Ministry of HRD, Government of India.
We have been re-accredited by **NAAC**
with 'A' grade with a CGPA of 3.4.



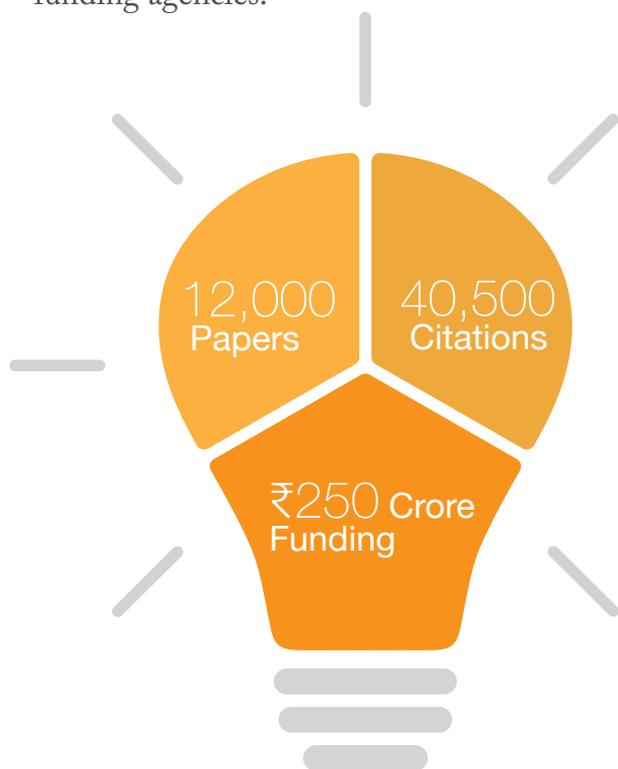
Present Status: Key Highlights





Present Status: Faculty & Research

With a faculty strength of 1700 (800 Ph.D. holding), the faculty-student ratio of 1:12 is one of the best in the country. The faculty of Amrita have published more than 300 books, and **12,000** papers in reputed peer reviewed journals and conferences, attracting **40,500** citations in the past thirteen years. We have secured research grants of over **Rs. 250** Crore from various Governmental and private funding agencies.



Amrita Vishwa Vidyapeetham's national and international rankings are a reward for the excellence in research.

Many Centres of Excellence have been developed in leading-edge areas like Nanosciences & Molecular Medicine, Biotechnology, Wireless Networks & Applications, Multimodal Applications & Human-Computer Interaction, Digital Health, Cyber Security Systems & Networks, E-learning, Advanced Technologies for Education, Biomedical Engineering,

Computational Engineering, Biosensors, Ayurveda, Spiritual studies, Women's Empowerment and Gender Equality. We have engaged in such endeavours with the support of major national laboratories and agencies including UNESCO, TIFAC, DST, ICMR, ISRO, DRDO, DBT, DIT, DRDO and industry giants Microsoft, Hewlett Packard, Infosys, Biocon and more. Descriptions of a few of these Centres are noted here:

Medical Sciences

Amrita Institute of Medical Sciences (AIMS) has pioneered several innovative products. These include the brain wafer (to treat brain cancer), Nanomedicine for drug-resistant leukemia, contrast enabled bone implant for large size defects, Nano textile implant for pancreatic cancer, Nano enabled hyperthermia for liver tumors, Nano vaccine for multiple sclerosis, and a low cost Raman-based screening tool for detecting oral cancer.

Earlier this year AIMS successfully performed the **World's First male to female upper arm transplant**, an internationally recognized achievement. Even as of 2015, AIMS' transplant research put India on the world map by being the **First in Asia to perform a double hand transplant**. AIMS also performed **India's first double organ transplant (kidney and pancreas)**. Other leading edge research has led to medical revolutions in 'transplant rejection' interventions that relax strict stipulations for donor compatibility, thus saving more lives. With 584 liver transplants, 608 kidneys, 5 heart and 148 cornea transplants, the Centre for Organ Transplants is one of the best in the country. Other inventions are the low cost, **automated insulin pump (US Patent, October 2011)**, and the **non-enzymatic glucose sensor (US Patent, March 2017)**

584 LIVER TRANSPLANTS

608 KIDNEY TRANSPLANTS

5 HEART TRANSPLANTS
148 CORNEA TRANSPLANTS

A group of computer scientists and medical doctors produced the highly successful **Amrita Hospital Informatics & Telemedicine Solution (US Patent)**, now deployed in more than **25 hospitals nationwide**, including the BARC and JJ Hospitals in Mumbai, Punjab Medical Sciences, BHU Hospital, etc.

₹96 CR
RESEARCH FUNDING

106 FUNDED PROJECTS

400+ JOURNALS
30+ PATENTS FILED

Amrita telemedicine network has been providing compassionate care through telemedicine since 2003, servicing remote islands such as Lakshadweep and Andaman-Nicobar, as well as Leh-Ladakh in Kashmir. Additionally more than 60 remote centres are connected to Amrita hospital through which tele-consultation and education are also provided to far flung areas in India.

The Centre for Nanosciences and Molecular Medicine, housed within the ambit of our medical school and 1450 bed super specialty hospital, includes a biomedical research facility with a 'Class 1000 Clean Room,' and with advanced manufacturing capability in precision manufacturing, has also been established. With over Rs. 96 crores in

research funding from 106 funded projects, the centre has an outstanding research track record with over more than 400 peer reviewed journal publications, more than 30 patents filed and 31 Ph.D. graduates. Research in smart, micro, and nano grids led to the innovative, patented Amrita Nano-solar storage cells.

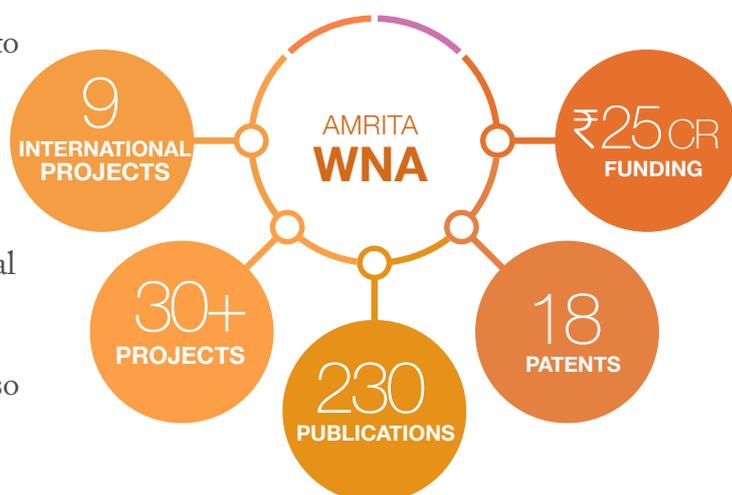
280 PUBLICATIONS

43 RESEARCH GRANTS

The Centre for Biomedical Technology pioneers cutting edge research combining Biotechnology, Ayurveda, and Medical Sciences in collaboration with top 500 world ranked universities including University of California, San Diego and University of Oxford, U.K. Publishing in high impact factor journals (4.5 avg), the Centre has more than 280 publications and 43 research grants.

Engineering

The Centre for Wireless Networks and Applications has pioneered wireless sensor development for monitoring, early warning, and mitigation of disasters such as landslides. The system's recognized success won an Honorable Mention in the Parliament, and an invitation from the Principal Scientific Advisor to quickly deploy similar networks in the Himalayas and the North East region.



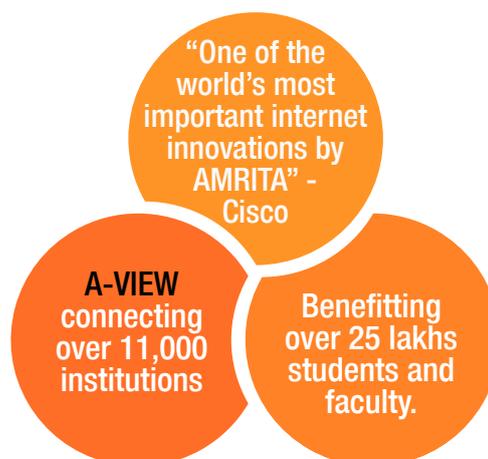
Present Status: Faculty & Research

The National Bank for Agriculture and Rural Development gave the National Rural Innovation award to Amrita's Real Time Landslide Monitoring and Detection System in 2012. The centre has been granted in excess of Rs. 25 cores in funding for 30 projects, resulting in 230 publications, 9 international projects, and with 4 patents awarded and 16 connectivity for commercial fishermen at 60 km which is 45 km beyond the range of cell-phone towers. This innovative system enables the government to disseminate warning messages to fishing vessels in the event of an impending disaster, so that they may return safely to shore.

The centre for Cybersecurity is focused on National Defence and Security related to mobile networks, critical infrastructure, cyber-physical, and Internet of Things systems, cloud based applications, healthcare services, and optimizing power for security. The team has built and implemented national systems, in partnership with MeitY and CERT-India, to protect critical internet infrastructure from advanced persistent threats. Amrita's award-winning Cybersecurity team reflects the department's academic and research excellence, as the **ethical hacking team is ranked No. 1 in India.**

The centres of Digital learning (AMMACHI Lab, CREATE Lab & A-VIEW Lab) focused on affordable Digital learning technologies and analytics for education and has reached more than **6,000 schools** in the country benefiting **15 lakh teachers and students.** To date the Centre has received more than **Rs. 20 crores in research grants** and produced over **74 publications.**

A-VIEW, Amrita's flagship E-Learning Platform, has been hailed as one of the world's most important internet innovations by Cisco, the worldwide leader in networking and internet applications.



Cisco identified and profiled the 40 best global public-sector examples of how the Internet of Everything is improving the lives of citizens everywhere. Amrita's A-VIEW platform (and the Govt. of India's Aadhar UID) projects are the only two projects from India finding a place in this world-wide list of novel initiatives. Today A-VIEW is connecting over **11,000 institutions** in the country, benefitting over **25 lakh** students and faculty.

International Collaborations

Further elevation of our research is achieved through our highly successful international collaborations.

Amrita pioneered the first ever collaboration with **20 of the top 100 International Universities including Harvard, Yale, Princeton, Madison, UC Berkley, Cornell, and many more** to deliver best of breed teaching and research through a network of 42 Indian universities in partnership with ISRO which culminated in an Indo-US bilateral agreement during the visit of the Indian Prime Minister to Washington DC.

The medical school regularly engages in international post-doctoral research and collaborative studies with some of the finest medical institutions and universities throughout the world, such as Harvard School of Public Health, Stanford,

Cambridge, NYU and University of Michigan, to name a few. About 50 medical students from international universities visit the campus for elective training annually.

Ayurveda and Allopathic alliances are gaining global recognition, and in 2017 more than 1,000 international delegates participated in India's largest conference on the **integration of Ayurveda and Allopathy** at Amrita. The scientific study of traditional knowledge relating to the medicinal, anti-cancer properties of cashew nut shells has led to international collaborations and publications from the Amrita School of Biotechnology with **UC Berkeley and UC San Diego and Scripps Research Institute, USA.**

Amrita also pioneered the **Indo European** alliance called **WINSOC** consisting of 10 eminent European institutions to collectively develop a system to monitor and provide early warning of large scale natural disasters.



Amrita has enjoyed a long and fruitful relationship with the United Nations (UN), culminating in many partnership and honors bestowed upon us by the UN. For example, the UN officially awarded Amrita India's first UNESCO Chair on Gender Equality & Women's Empowerment. The Chair will identify vulnerabilities of women and girls throughout India, utilizing comprehensive 'vulnerability mapping' in such areas as security, education, skill-development, social and cultural environment, climate change, disaster risks, health, sanitation, and more.

United Nations Academic Impact (UNAI)

In 2016, Chancellor AMMA gave a keynote address to researchers representing **93 leading international universities** at a conference co-hosted by Amrita and the UNAI in New York. Amrita faculty presented humanitarian-oriented research done in collaboration with world class universities such as **Cambridge, EPFL, Monash, the National University of Singapore, Oxford, Stanford and University of Twente.**

Industry Collaborations

Translation and transfer of technology of our research into products is facilitated through industry collaboration

The Amrita- Robert Bosch Automotive Electronics Laboratory was established in 2014 with an investment of **18 crores**, to bridge the gap between academia and industry. The well-equipped lab supports the work of about **350 students** pursuing degrees in engineering fields and fostering interdisciplinary research.

IBM & Genpact MoU. The MoU with two industry giants was to help develop our students in industry-oriented knowledge and skills in data analytics. We believe this partnership will help us build a sustainable talent pool in niche analytics areas, and provide students with a deeper appreciation of analytical tools and their application in an increasingly data-driven world.

Other collaborative centers with industry TCS, Robert Bosch, ELGI and HP, Microsoft and Agilent Technologies have also been established in Amrita campuses

The Technology Business Incubator (TBI) of Amrita won the **National Award for the best TBI** from the Government of India, and was selected as the 4th most prolific incubator by the Economic Times in 2015. NITI-Ayog's Atal Innovation Mission selected Amrita

Present Status: Faculty & Research

122 STARTUPS
INCUBATED

216 STARTUPS
MENTORED

14 PATENTS
FILED

TBI amongst the top 150+ incubators in the country to be built into a world class incubator. To date, Amrita TBI has incubated 72 startups, mentored 216 startups, and filed 14 patents.

India: Societal Impact

For Amrita, the culmination of research is in societal benefit.

The university has been active in translating its multitude of educational and research initiatives towards uplifting those less fortunate.

Amrita **Live-in-Labs**[®] program is the one that is most notable. **Live-in-Labs**[®] exposes students to problems faced by rural communities in India. Through experiential learning opportunities, participants put theory into practice by applying critical and collaborative problem solving abilities to generate innovative solutions for real problems.

Live-in-Labs[®] has served 58,953 beneficiaries in 21 states with 63 projects, partnering with more than 30 institutions

worldwide for 2,00,000+ field hours.

Examples of work include: solar lemon grass distillation for tribal community, a micro-hydroelectric power project, load carrying aid for rural women, low cost rice planting machine (ricycle), a water distribution system, a rural sanitation model, health workers training and assessment, the AAA program (Amrita Awareness Ambassadors; trains village student ambassadors to educate

younger children and their peers on issues of nutrition, substance abuse, etc.), and a low-cost biofuel production setup.



Hygiene & Sanitation

- Winners of 'Reinvent the Toilet Challenge: India,' sponsored by **Bill & Melinda Gates Foundation** and BIRAC, India for employing novel biocontrol methods for treatment of waste water, increase availability of decontaminated water, and improve sanitation in India.
- Community Sanitation through Democratic Participation (WE:CSDP). Empowering women to build toilets and to learn about sanitation and sustainability is part of a two-year, pan-India initiative jointly funded by the United Nations Democracy Fund (**UNDEF**). More than **5,000 women** have been empowered in rural communities across India to champion sanitation and community development.

“Of all of the projects which the UN funds around the world, this is the one dearest to our heart. It’s the one we are proudest of; and it’s the one that we intend to take to the rest of the world so that they can learn from what you have achieved .”

- Ms Lise Grand,
Former Resident Director of the United Nations in India

- Amrita also designed an innovative 3D modeling mould-based technique, making toilet construction easy, efficient and economically viable, reducing toilet construction time by half, from 76 hours to 40 hours, our

students and faculty, working under the guidance of our parent NGO, have constructed more than 10,000 toilets in 18 months across the country.

- Amrita’s ‘MySangham’, a portal for vocational education, was among the winners of **Facebook’s** prestigious award for transforming more than 1,000 women’s self help groups into skilled entrepreneurs.
- **World Bank** funded ‘India: e-Delivery of Public Services DL.’ Amrita’s eGAP (e-Governance Analytics Platform) will provide G2C (Government to Citizen) services to more than 14,300 schools, helping tens of lakhs of students, teachers, and parents.

Present Status: Projects of Societal Impact



Non-registered local herbs used as medicine to develop income generation

Juna Kattiwada, Madhya Pradesh
Amrita Participants: A Center for Environmental Studies, School of Pharmacy, ACIP, Dept. of MSW
International Participants: L'École Polytechnique Fédérale de Lausanne, (EPFL), Switzerland



Scalable and Sustainable Rural Sanitation Model

Dunda, Uttarkashi, Uttarakhand
Amrita Participants: ACIP, AMMACHI Labs
International Participants: L'École Polytechnique Fédérale de Lausanne, (EPFL), Switzerland



Empowering Artists

Dr. Khera Village, Lucknow, Uttar Pradesh
Amrita Participants: ACIP, AMMACHI Labs
International Participants: University of Massachusetts Dartmouth, Dartmouth, MA.



Unified Framework for Affordable Healthcare for All

Nani Borwai, Gujarat
Amrita Participants: ACIP, AMMACHI Labs, ECE, ASeRve
International Participants: Saint Louis University, USA.



Public Health Awareness Program

Ratanpur, Bihar
Amrita Participants: ASeRve, ACIP, MSW
International Participants: Ryerson University, Canada



Scalable and Sustainable Rural Sanitation Model

Byse, Shimoga, Karnataka
Amrita Participants: ACIP, AMMACHI LAB, Civil Engineering
International Participants: L'École Polytechnique Fédérale de Lausanne, (EPFL), Switzerland



Amrita Water Distribution System - Water Management in Rural India

Guptapada Village, Khurda, Odisha
Amrita Participants: Amrita Center for Wireless Networks and Applications, ACIP, ASeRve, Dept. of Civil Engineering



Alcohol Awareness for Children in Tribal Villages

Wayanad, Kerala
Amrita Participants: School of Social Work, Amrita CREATE, ACIP
International Participants: Harvard School of Public Health, USA



Lemon Grass Distillation

Wayanad, Kerala
Amrita Participants: Dept. of Chemical Engineering and Material Sciences, ACIP, AmritaWNA
International Participants: TU Delft, Netherlands



Amrita Micro Hydro Electric System - Illuminating Rural India

Komalikudi Village, Idukki, Kerala
Amrita Participants: AmritaWNA, ASeRve, Dept. of EEE, Dept. of Civil Engineering, Center for Nanosciences, AIMS, ACIP

Asia's First Double Upper Arm Hand Transplant (Male to Female)



Completed 700
Robotic Surgeries in
2 years

Women Empowerment Programs

10,000 toilets
in 18 months

5000+
rural women
empowered

1000+
women SHGs
into skilled
entrepreneurs



Present Status: Recent Faculty Accomplishments

Dr. Shanti Nair	C.N.R. Rao Award, 2014
Dr. Maneesha Ramesh	World Landslide Forum Award, 2017
Dr. Jaya Kumar	India Research Excellence-Citation Awards, 2017
Prof. Bhavani Rao	UN Chair for Gender Empowerment, 2017
Dr. Krishna Kumar	Global Outreach Award in Spine Surgery, Scoliosis Research Society
Dr. Indulekha Pillai	Ramalingaswamy Re-entry Fellowship Award
Dr. Shantanu Bhowmick	8th Acharya Prafulla Chandra Ray Award from the Institute of Pulmocare and Research
Dr. Bhaskaran Pillai	Elected as Fellow of the American Association of Physicists in Medicine (AAPM).
Dr. Sanjeev K Singh	British Medical Journal Award 2016 for Infectious disease control & prevention
Dr. Maneesha Ramesh & Prof. Shyam Diwakar	Young Faculty Research Fellowship under Visvesvaraya Ph.D. scheme for Electronics and IT for the year 2015-16
Ms. Vijisha	International Award from Maquet Group, Germany, as the No.1 Performer of Endoscopic Vein Harvesting Technique in India
Dr. Sahadev Shankarappa	Ramalingaswamy Re-entry Fellowship
Dr. Manzoor Koyakutty	Elected as Fellow of The National Academy of Science (FNASc), India, in October 2017
Dr Prema Nedungadi	Digital India 2016, award in the category Empowerment for Good Governance
Dr Sudhakar Achath	Honored with Dewang Mehta Award for Best Teacher award.
Dr Madhura Purnaprajna	Won the Early Career Research (ECR) Award of SERB

Present Status: Recent Student Accomplishments

Amrita's vibrant, enthusiastic students strive hard to excel in their chosen fields, and their high levels of success in global competitions demonstrate their proficiencies are on par with some of the world's top universities.



CSAW'16

Ranked 1st in India, and 48th globally among 2,450 teams at the Cyber security event CSAW 2016

UNIVERSITY OF OXFORD

Nominated for Commonwealth Scholarship at University of Oxford

ESOMAR APAC

Only student representative from India at ESOMAR APAC 2015

INDO - NEPAL INTERNATIONAL RURAL BOXING CHAMPIONSHIP

Won gold medal in the Indo-Nepal International Rural Boxing Championship

CISCO

1st place at Cisco's Great Digital India IoT Challenge: iDEATE

IES IEEE

Won IEEE IES Student Chapter Award among all global student chapters

IEEE PES

Ranked 1st in Asia Pacific IEEE-PES Student Branch Chapter

UK URC

Rover Phoenix, Amrita's Mars Rover team, at 4th position among 40 teams in the Rover Challenge

acm International Collegiate Programming Contest

Selected to World Finals at the ACM International Collegiate Programming Contest

Google Summer of Code

Students win Google Summer of Code 2016 and Outreachy'12 internships.

Computer Society of India's (CSI) Award

Won Computer Society of India's (CSI) Award

TATA

Won TCS Best Student Project Award

Parameter-wise Gap Identification as per regulation 4.2 and 4.3

Act/ Reg.	Characteristics of Institute of Eminence Deemed to be Universities	Key Performance Indicators
4.2.1	It should preferably be multi-disciplinary or interdisciplinary and have both teaching and research focus of an exceptionally high quality.	Interdisciplinary Research Programs
		THE World Ranking - Teaching (Percentile)
		THE World Ranking Research (Percentile)
		THE World Ranking Citation (Percentile)
4.2.2	It should offer interdisciplinary courses, including in areas of emerging technology and interest as well as those of relevance to the development concerns of countries like India and also award degrees, diplomas and other academic distinctions in such interdisciplinary areas.	Total Interdisciplinary Courses Offered
4.2.3	It should have a good proportion of foreign or foreign qualified faculty.	Total Foreign Faculty/ Total Faculty (%)
4.2.4	There should be a reasonably good mix of Indian and foreign students.	Total Foreign Students/ Total Students (%)
4.2.5	There should be a transparent merit based selection in admissions, so that the focus remains on getting meritorious students.	Compliance (%)
4.2.6	The admission process should be need-blind - so that once a student gets admission purely on merit, such a meritorious student should not be turned away for lack of financial ability.	Compliance (%)

	Present Status	Gap	Target for 10th Year	Remarks
	12.5%	37.5%	50%	Currently, we are multidisciplinary with over 200 degree programs distributed across seven faculties, and interdisciplinary with respect to academic programs as well as research. Our target for interdisciplinarity in courses and research is 50%.
	22	1	23	
	9.5	8.5	18	
	17	52	69	
	10%	40%	50%	E.g., of courses offered currently: M.Tech (Nanomedicine), M.Tech (Nanotechnology & Renewable Energy), M.Tech (Molecular Medicine), Master's in Medical Lab Technology, M.Tech (Biomedical engg), MHA (Masters in Hospital Administration) etc.
	10.4%	9.6%	20%	Currently, 12% of our faculty are foreign faculty (200) Our target is to reach 25% in 10 years and 30% in 15 years, which we believe are good numbers
	2%	13%	15%	Currently, 2% are foreign students, target is to reach 15% in 10 years and 25% in 15 years
	100%	0%	100%	We are on target. For PG students, we will add GATE and CSIR qualifications in the future. For foreign students, we will add SAT and GRE to improve the quality of admitted students. Transparency of admissions is ensured through merit based selections and display of admission policies & procedures on the university portal.
	100%	0%	100%	Need blind: In place

Parameter-wise Gap Identification as per regulation 4.2 and 4.3

Act/ Reg.	Characteristics of Institute of Eminence Deemed to be Universities	Key Performance Indicators
4.2.7	The faculty student ratio should be not be less than 1:20 at the time of notification issued declaring an Institution as an Institution of Eminence and should increase over time so as not to be less than 1:10 after five years of this date. The faculty for this purpose includes the regular faculty, adjunct faculty, and long term faculty (for at least three years). Part time faculty shall not be counted for the purpose.	Faculty Student Ratio
4.2.8	There should be laboratory facilities to undertake cutting-edge scientific research for those Institutions of Eminence Deemed to be Universities doing scientific research. In case of humanities, social science and other interdisciplinary areas, the faculty should be engaged in research and field work in frontier areas using the latest methodologies.	Total Floor Space for Research (Lakh Sq. Ft.)
4.2.9	The Institution of Eminence Deemed to be University should strive to achieve social impact by engaging in applied research and innovation in issues of concern to developing societies.	Villages adopted for Sustainable Development
4.2.10	The Institution of Eminence Deemed to be University should develop teaching and research collaborations with a reasonable number of global universities figuring in the most reputed global rankings.	Total International collaboration with Top 500 World Ranked Universities
4.2.11	An initial corpus fund of Rs. 60 Crore...	Compliance (%)
4.2.12	The Institution of Eminence Deemed to be University should be known for promoting a culture where faculty are encouraged to publish regularly in peer-reviewed journals and engage academically with the issues of concern to the society. It should have a record of research publications at the mean rate of at least one per faculty member each year in reputed peer reviewed international journals based	Papers per Faculty

	Present Status	Gap	Target for 10th Year	Remarks
	1:12	Minor Gap	1:10	Currently, 1:12. Will reach 1:10 in 5 years as per plan.
	3	4	7	We have excellent facilities for research in engineering, biomedicine and medical research. Existing facilities include, nano manufacturing and thin film deposition with a total lab infrastructure space of 3 lakh square feet. Having developed an excellent strategic research plan for smart manufacturing and hardware solutions, we will develop state-of-the-art facilities for a full range of manufacturing research. Addition of 4 lakh sq. ft. is estimated as a critical requirement for reaching our strategic goals.
	21	54	75	This is a key strength of Amrita as most of our academics and research activities are geared towards solving societal challenges. We are aiming to increase the reach of our projects to 90 villages adopted across India.
	59	91	150	Currently, Amrita has 59 international collaborations with the top 500 ranked universities. Plan is to reach 90 in 5 years and 150 in 10 years
	100%	0%	100%	
	0.6	1.4	2.0	Target is 1.2 papers per faculty per year in 5 years and 2.0 papers per faculty per year in 10 years and 2.5 papers per faculty per year in 15 years.

Parameter-wise Gap Identification as per regulation 4.2 and 4.3

Act/ Reg.	Characteristics of Institute of Eminence Deemed to be Universities	Key Performance Indicators
4.2.13	The Institution of Eminence Deemed to be University should have a world-class library with subscriptions to reputed journals in the areas of courses it is offering.	Books Journals & e-Journals eBooks & Digital Assets
4.2.14	The Institution of Eminence Deemed to be University should have student amenities comparable with that of globally reputed institutions.	Sport Facilities like Stadiums, Gyms, Swimming Pools (Acres)
4.2.15	The Institution should be accredited by National Assessment and Accreditation Council (NAAC) or an alternative version of NAAC which conforms to UGC (Institutions of Eminence Deemed to be Universities) Regulations, 2017 or its amendments and also be assessed by at least one reputed international accreditation agency, one whose ratings are a credible and widely accepted global benchmark. The Institution may however appeal on accreditation of NAAC or alternative version of NAAC to the Empowered Experts Committee, whose decision shall be final.	NAAC
		ABET
		NBA
		NABL
		NABH
		AACSB
	Others	
4.2.16	The Institution of Eminence Deemed to be University should have reasonably large owned / long term leased (at least thirty years) campus with adequate space for expansion.	Compliance (%)

	Present Status	Gap	Target for 10th Year	Remarks
	2,52,000 50,000 6,98,727	63,000 22,000 1,26,273	3,15,000 72,000 8,25,000	We have a very strong digital library with subscription to all top journals in the fields of our strength. We have over 2,52,000 collection of books, 6,98,727 ebooks and over 50,000 e-Journals. The plan is to increase the collection of books to 3,15,000 and the subscription of ebooks to 8,25,000 in 10 years and try to reach 1 million ebooks in 15 years.
	5.4	9.1	14.5	We do have a gap in this area such as hostel (dormitory) to cater to international students, and expansion of indoor international level sports facilities. The plan is to add international level accommodation and sports facility in 10 years. Additional 9.1 acres of sports facility is planned compared to the 5.4 acres presently available.
	'A' grade	'A' grade	'A' grade	We are NAAC re-certified in Sept 2014.
				8 Programs by the 5th year
				23 Programs by the 5th year
	Yes		Yes	We are the first teaching hospital in India with NABL & NABH accreditation.
	Yes		Yes	
	No		Yes	We are in the final stages of accreditation for the Management school.
	Healthcare ISO 9002-2000 NABL & NABH Accreditation		8 programs by ABET and 23 programs by NBA	1 CAP accreditation in 5 years.
	100%	0%	100%	Adequate space for expansion available (Land availability: 938 Acres)

Parameter-wise Gap Identification as per regulation 4.2 and 4.3

Act Ref.	Characteristics of Institute of Eminence Deemed to be Universities	Key Performance Indicators
4.2.17	The governance structure of the Institution of Eminence Deemed to be University should be distinct from the governance structure of the Sponsoring Organization.	Compliance (%)
4.2.18	The Institution of Eminence Deemed to be University should achieve a student enrolment of at least ten thousand over a period of fifteen years. However, the institutions may project a lower figure as its enrolment target with justification on how that enrolment figure would enable it to become a world class university.	Compliance (%)
4.2.19	It should come in top five hundred of any of the world renowned ranking frameworks (such as the Times Higher Education World University Rankings or QS or Shanghai's Jiao Tong University) in the first ten years of setting up on being declared as Institution of Eminence, and having achieved top five hundred rank, should consistently improve its ranking to come in the top one hundred eventually over time.	Times Higher Education

	Current Status	Gap	Target for 10th Year	Remarks
	100%	0%	100%	In compliance.
	100%	0%	100%	In compliance.
	801+	300	<500	From its very inception, Amrita has been consistently on a fast track of growth. Currently ranked 800-1000 in THE world ranking, we plan to achieve a ranking within top 500 in the next 10 years.

Part 1. III c

Plan to become an Institution of Eminence. The plan should give the status of the Institution at the present stage on all relevant parameters, the status to which they seek to reach after ten years and fifteen years on each of the parameters, and how they target to reach the same on each of the parameters.

Our plan to bridge the gaps and reach the status of a top 500 world ranked university is based on directed progress along five strategic pillars, namely Interdisciplinary, Innovation, International, Industry & India, that

collectively impact the 19 parameters listed in Section 4.2 & 4.3. In the following sections we elaborate our proposed plan and action items under each of the pillars and correlate them to the 19 parameters.

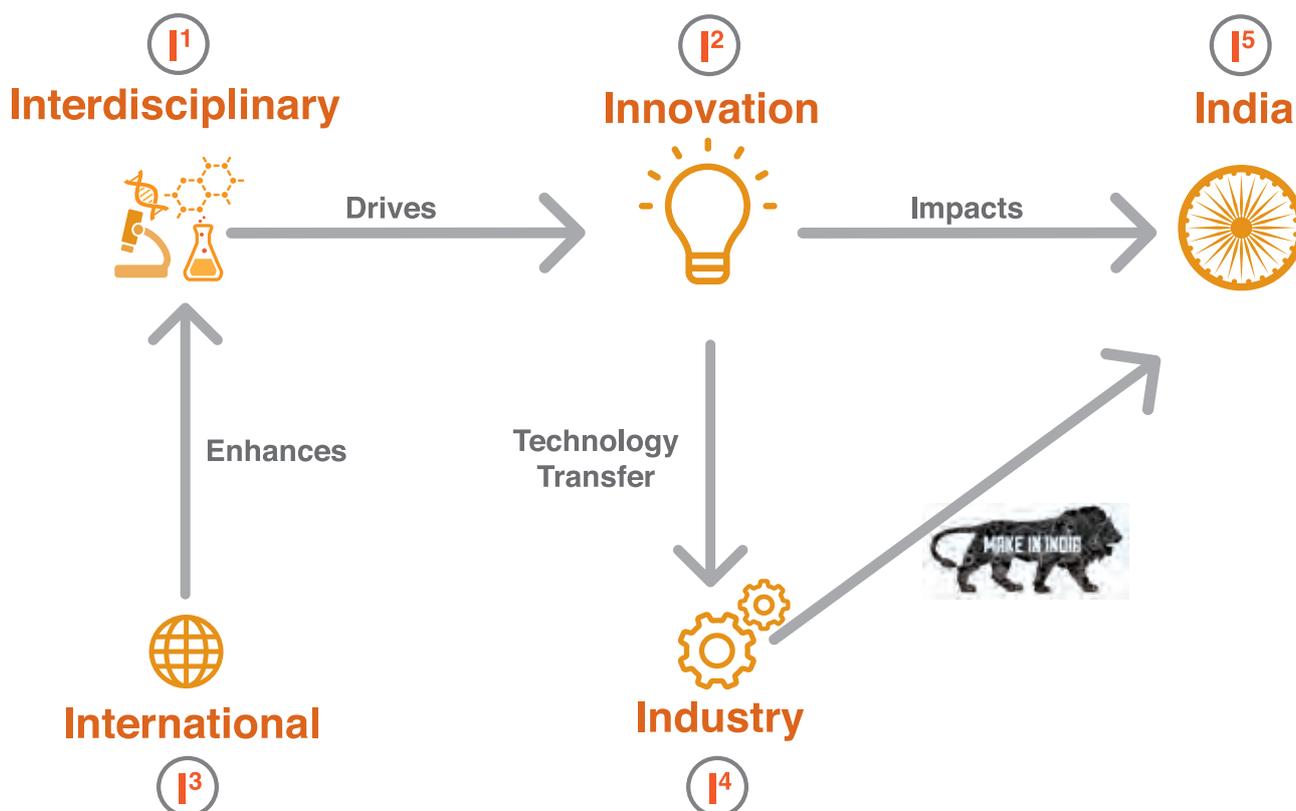
Institutional Goals for IoE	Sub Goals	Parameters / Key Performance Indicators	Present Status	Target for 10 th Year	Target for 15 th Year
Global Recognition	Global rankings	THE World University Rankings	800-1000	400-500	300-350
	Attract world class faculty	% Foreign faculty	10%	20%	30%
	Attract international students	% Foreign students	2%	15%	25%
	International Collaboration	Total no. of collaborations with top 500 ranked universities	59	150	200
Research Excellence	Innovation	No. of patents granted per year	5	20	30
	Faculty publications productivity	Papers per faculty per year	0.6	2	2.5
	Faculty research quality	Citations per paper per year	3.5	7	9
	World class lab infrastructure	Built-up lab space (in sq. ft.)	3 Lacs	5.4 Lacs	7 Lacs
Academic Excellence	Quality of teaching	% Ph.D. holders	47%	90%	100%
	Teaching effectiveness	Faculty Student Ratio	1:12	1:10	1.10
	Academic innovation	% Interdisciplinary courses offered	12%	50%	50%
Social Impact	Building self reliant villages - water & sanitation, energy, health, education, agriculture, infrastructure and employment.	Villages adopted in India	22	75	101

Amrita's Pillars for achieving the parameters of IoE:

Amrita Vishwa Vidyapeetham aims to become an Institution of Eminence by satisfying the objectives and characteristics stipulated by the IoE. We intend to do this by building upon the five fundamental, strategic pillars. Collectively we refer to these pillars as the five I's, noted hereafter as 5 Is.

As shown in the figure above, these pillars are:

Interdisciplinary
Innovation
International
Industry
India.



In this section below we will provide an overview of each of these, stipulating how these pillars will help us to attain the IoE goal.

1 Interdisciplinary

Interdisciplinary is our first strategic pillar of research. The problems of the future are highly complex and require experts from various disciplines to work together in finding solutions to these challenges. Building on our strengths in the foundational disciplines of engineering, medicine, sciences, and management, our plan is to channelise our efforts largely into the confluence of these areas. As shown in the figure above, interdisciplinary research drives innovation across the board in all departments of the university.



Interdisciplinary research and academic activities, both within and between disciplines, will augment student and faculty creativity that will inspire new directions in research to benefit humanity and the world. Unconventional programs will allow cross-discipline learning, extending knowledge beyond the borders of one's primary field. Pathways will be established wherein students of one discipline spend time in another, expanding their horizons, creativity, and critical analytical skills.

We have identified nine major interdisciplinary research domains that collectively yield 132 highly challenging and impactful research topics which will be addressed in the next 15 years. The academic and research plans will revolve around these challenging areas with the expectation that the next generation of

students and researchers are trained to be problem solvers. In this process, we expect to introduce 116 new programs, that are predominantly interdisciplinary

These initiatives directly impact the objectives 3.1, 3.2, 3.4, as well as characteristics 4.1.iii, 4.1.v, 4.1.x, 4.1.xi

Amrita's Interdisciplinary initiatives are elaborated in much greater detail in subsequent sections of 3c and 4a.

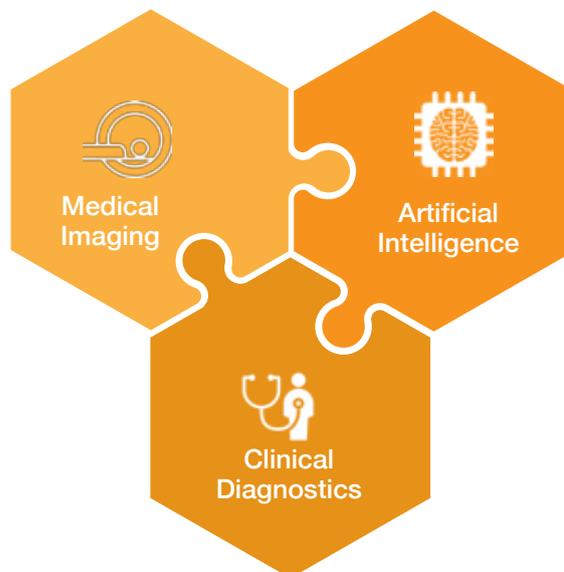
The nine major interdisciplinary thrust areas are:

1. Health Sciences–Antibiotic Resistance
2. Medical Imaging & Robotics
3. Nano-Bio-Medicine
4. Digital Health
5. Integrative Medicine
6. Smart Hardware & Manufacturing
7. Management Sciences
8. Pedagogy & Learning Technology
9. Sustainability & Resilient Communities

Health Sciences-Antibiotic Resistance

This thematic area brings together the disciplines of medical sciences, informatics and public health. Researchers including microbiologists, physician scientists, clinical infectious disease specialists, molecular biologists, biomedical engineers and IT data analysts, come together to tackle an alarming global crisis, i.e., rapid emergence of multi drug resistance bacteria, fungi, and viral pathogens. This might well neutralise decades of work in developing newer antibiotics with minimal or no side effects. Early detection, precise

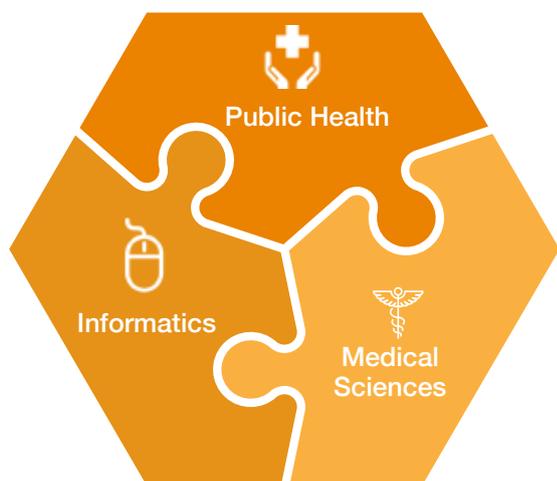
diagnosis of pathogen and sensitivity to antibiotics, careful scrutiny of emergency antibiotic resistance in the community and the rational use of antibiotics by the medical community including pharmacists and public at large will ensure that we as a global community can withstand the onslaught of these deadly pathogens. This is particularly pertinent for India, as we suffer from the highest incidence of antibiotic infection in the world due to the unregulated and indiscriminate use of antibiotics.



Medical Imaging & Robotics

Nano-Bio-Medicine

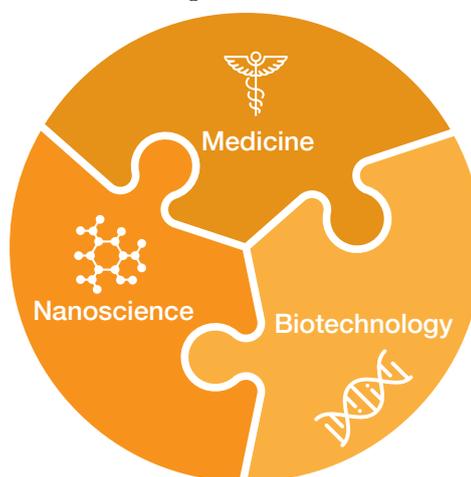
This thematic area brings together the disciplines of Medicine, Nanotechnology, and Biotechnology. Research in health and medicine are among the most vibrant areas in top ranked universities around the world. This highly interdisciplinary area brings together medical doctors and molecular biologists, micro, nano & bio-technologists, and social workers with compassion & care.



Health Sciences-Antibiotic Resistance

Medical Imaging & Robotics

This thematic area brings together the disciplines of medical imaging, artificial intelligence, and clinical diagnostics. Researchers including clinical specialists, pathologists, interventional radiologists, IT specialists, biomedical engineers, clinical informatics and data analytics come together to co-innovate and co-create a high precision diagnostic service for imaging, invasive biopsies, and digital pathology diagnostics with instant consultative capability to any of the networked centres in the globe. Future work in the emerging area of artificial intelligence and machine reading will enhance accuracy in diagnosis, speed of reporting, patient safety and enhance cure rates following ablative therapy.

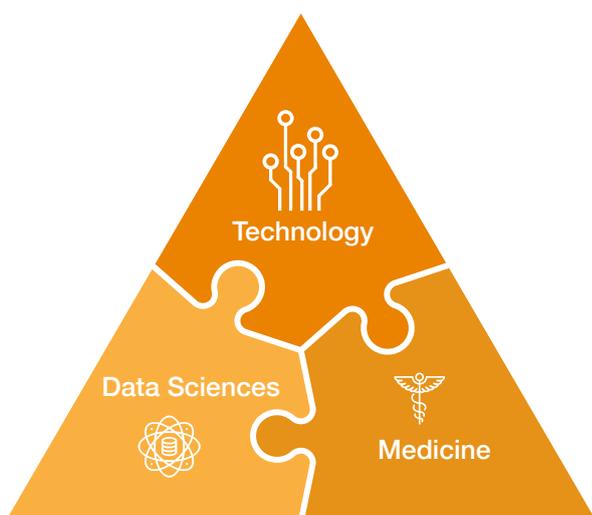


Nano-Bio-Medicine

Building on a current world-class research base within Amrita, our future work is projected to deliver breakthrough results in nanomedicines, nanomaterials for implants/delivery systems/theragnostics, 3D organ printing, clinical research, transplant medicine, epidemiological research, public health and more.

Digital Health

This thematic area brings together the disciplines of Data Sciences, Technology, and Medicine. Strong research teams with health sciences, life sciences, computational, CSE, medical imaging and Machine Learning, provide Amrita a distinct and unprecedented opportunity for interdisciplinary research in drug discovery, data-driven clinical trials, public health, personalized medicine and intelligent clinical decision support systems.

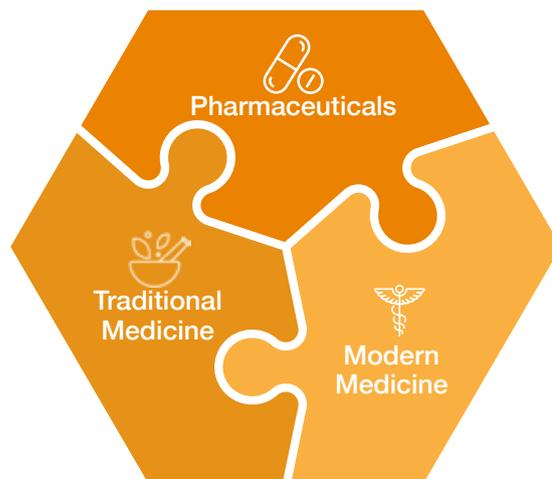


Digital Health

Interdisciplinary teams from medicine, public health, engineering and data science will work together delivering cutting-edge research solutions in the areas of computational drug design, hospital informatics, telemedicine, molecular-based clinical decision support systems, and personalized health monitoring systems.

Integrative Medicine

This thematic area brings together the disciplines of traditional medicine, modern medicine, and pharmaceuticals. The Amrita Centre for Advanced Research in Ayurveda has set up Amrita Sparsham – Integrative Cancer Clinic to bring the benefits of Ayurveda for improving the quality of life of cancer patients through an integrative approach by collaboration of Ayurvedic physicians and Allopathic doctors.



Integrative Medicine

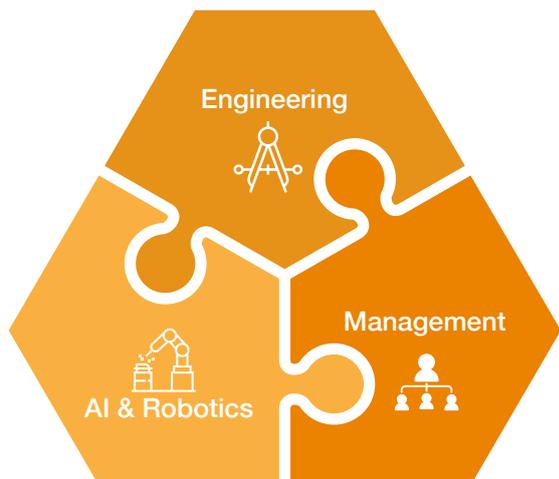
Having formed a network of over 1000 practitioners and researchers from the fields of modern medicine, ayurveda, and pharmaceuticals through establishment of a professional society and conduction of scholarly meetings, the centre explores ways of integrating the three disciplines for enhanced management of healthcare.

Smart Manufacturing & Hardware Systems

This thematic area brings together the disciplines of Internet of Things & Artificial Intelligence (IoT & AI), Management and Engineering. Hardware & Manufacturing is given special importance based on the observation that it is practically non-existent in our nation's landscape. Hardware imports exceed an estimated value of around Rs. 200K crores and this is yielding an upper hand to China. If brought back to India, it has the potential to create several million jobs.

For instance, in the area of medical devices, hospitals all over India spend an estimated Rs. 100K crore on annual imports. This is substantiated by our own hospital's requirement of Rs. 30 crores import of biomedical equipment.

It is our goal to enable development & manufacturing of such biomedical equipment in India itself thereby saving huge import



Smart Manufacturing & Hardware Systems

expenses and ultimately bringing down the cost of delivering healthcare to patients. A world class Hardware and Manufacturing facility, targeted for 2019, will be a major new step forward with the intent of satisfying the 'Make in India' program, and to provide affordable products for India.

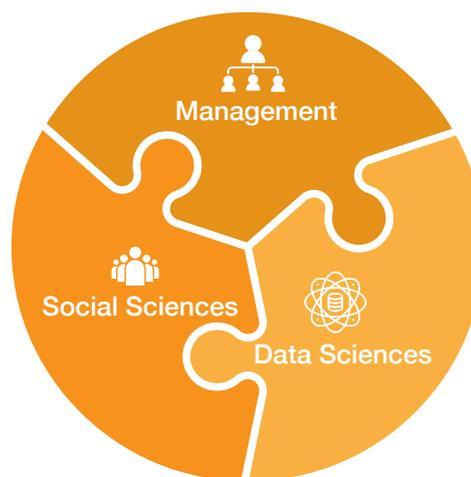
DRDO's Technology Development Fund has, in-principle, cleared a research project on development of advanced thermo-plastic composite material using carbon fiber as a reinforcing agent. Light-weight material for bunkers, power generation using wind and solar energy, and Aerostat intrusion detection system, are some other projects meant for armed forces which are currently in progress, directly supporting the Make-in-India.

Nationwide, hospitals spend close to a staggering Rs. 100,000 crores a year on the import of expensive class I and II class medical equipment. For instance, our own Amrita Institute of Medical Sciences, spends about Rs. 30 crores a year on such imports. A significant benefit of our thrust area is that, lower cost, indigenous manufacturing research will lower the cost for patients, and make India self sustainable in the medical equipment sector, and competitive in the international market by exporting affordable equipment. Further, manufacturing of advanced drugs, such as, nanomedicines, and natural medicinal

products, will give India a huge edge as the combined market value of these products is about Rs. 70,000 crores.

Management Sciences

This thematic area brings together the disciplines of management, social sciences, and data sciences. The broad intersection of management, social sciences and data sciences will form a new interdisciplinary approach to address topics like poverty-inequality-exclusion, innovation, behavioural pattern and decision-making, analytics for society business and policy. Nature of information and data has also influenced the businesses and their approach. Data analytics therefore is becoming a relevant and critical research path to be perused, not for the sake of it but for societal benefit and affirmative interventions.



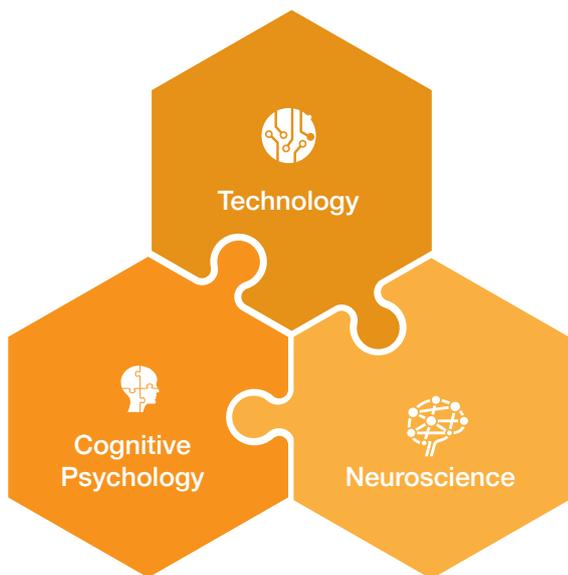
Management Sciences

While the big organizations are vouching for cloud computation and Open sources, others are utilizing such information for aggregation of businesses in different newer ways. Two fall out of these disruptive changes are identified in Innovation as well as value co-creation. It is also important to re-think institutional (both business as well as societal) models keeping sustainability in mind.

Pedagogy & Learning Technologies

This thematic area brings together the disciplines of Cognitive Psychology,

Neuroscience, Technology. Amrita has a leadership position in Digital Education, building pedagogically sound and award-winning technologies enhanced learning solutions in Skill Development using haptics and HCI, school education with adaptive learning, simulation and game based learning with O Labs, Virtual Labs, MedSIM, distant learning technologies, immersive learning environments.



Pedagogy & Learning Technologies

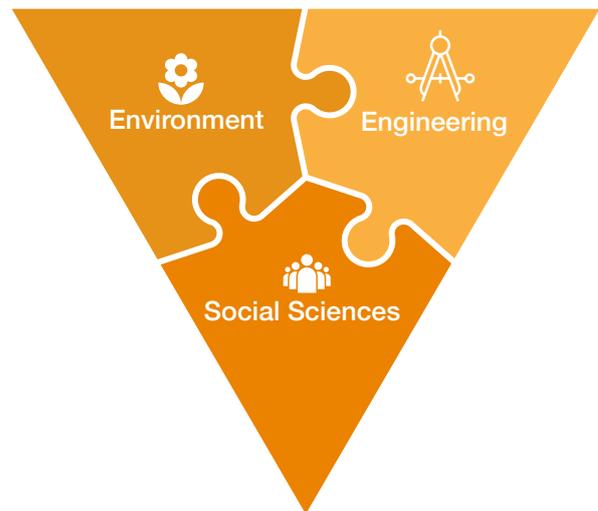
Our research will be at the intersection of pedagogy, neuroscience, clinical psychology and engineering, with assistive and personalised technologies for different learning disabilities such as dyslexia, hearing impaired and autism. Additionally, strong contributions are projected in the area of digital governance and data science & analytics.

Sustainability & Resilient Communities

This thematic area brings together the disciplines of Environment, Engineering, and Social Sciences. Sustainability touches the very survival of life on our planet. The United Nations has systematised the challenges under the seventeen UNSDGs (United Nations Sustainable Development Goals).

Recognising Mata Amritanandamayi Math's

wholehearted efforts and proven track record towards protecting life and the environment, the **UN Academic Impact invited Amrita Vishwa Vidyapeetham to propose solutions towards achieving the SDGs.** In response, we have selected nine of the SDGs spanning Health, Education, Gender Equality, Clean Water & Sanitation, Affordable & Clean Energy, Sustainable Cities & Communities to focus our research efforts. The rewards are expected to be of lasting value to the society.



Sustainability & Resilient Communities

For our above ambitious plans to materialise we plan to invest adequately in recruiting highly talented new faculty, implement a performance based career advancement plan, and state of the art experimental laboratory setups.

- We will ramp up our **Ph. D. faculty hiring by 100 per year for next 10 to 15 years**, with an increasing proportion of them coming from the top 500 ranked international universities and award them with start-up research grants.
- For career advancement, we plan to set publication benchmarks for all faculty at each stage in their career, which benchmarks will then be woven into our confirmation and promotion processes. We plan to start a tenure track system that

emphasizes research as a mandatory part of the responsibilities of faculty and will involve the introduction of international academicians from world class universities in the review process.

- **₹500 crores** has been planned to be allocated for state of the art laboratory infrastructure with an additional built up area of **4 Lacs** sq. ft. including our upcoming campuses in Delhi (NCR) and Amaravathi, in addition to the existing 5 campuses.

I² Innovation

Innovation, the second strategic pillar, is an integral part of our curriculum. Amrita aims to cultivate a university culture of innovation and motivation in research, academia, and in entrepreneurship. We will expand opportunities, incentives, and expectations, for students and faculty to actively engage in research and writing endeavors, and carry research innovation to the highest level of service and production. The diagram depicting **5 Is** shows that innovation creates technology which is transferred to industry and also has a social impact in India.

With regard to students, when entering the UG level, the spark of creativity will be lit through a variety of initiatives, such as project-based learning, maker-space, tinker spaces, Live-in-Labs, and opportunities to have a research advisor. At the PG level, each student has a research advisor, and the publication of the research results in a peer-reviewed conference or journal paper. At the Ph.D. level, research and original thinking are strongly promoted leading to high quality research papers. In addition to being a world class teacher, every faculty member will be encouraged to become a researcher. Incentives will be given to foster faculty participation in research activities of designing and

implementing a project from start to finish, writing papers, giving presentations, and attending conferences. Faculty will be supported to publish high quality papers in international forums that attract higher citation numbers.

“Innovation that is successful will naturally flow into greater fruition, significantly serving larger humanitarian need. Others will follow a natural course into skilled entrepreneurship, an area of strength for Amrita, as evidenced by being recognized as **India’s number one Technology Business Incubator(TBI)**. We are also aligned with Atal innovation mission and Start-up India, two reputed platforms supporting visionary technological developments, start-ups, and challenges.

All of the above activities are expected to give a significant impetus for research and innovation, raising these areas to top ranked university levels through the publication of **2.5 papers per faculty per year in peer reviewed journals**.

This would thereby directly address all the 5 objectives (3.1 to 3.5 of regulations,) as well as the following characteristics, 4.1.i, 4.1.iii, iv, v, x, xi

Our plan is to create the following ecosystem:

- **Innovations to emerge in classrooms and laboratories:** We plan to create new learning spaces where the layouts can be adaptably changed according to the requirements of each session, integrating lecture delivery and collaborative learning. These learning spaces will foster critical thinking, problem solving and open ended design. Our plan is to introduce projects in 132 courses belonging to 116 programs at both UG and PG levels in science and engineering and PG levels in medicine and management.

- **Prototype development in Maker Spaces:** We will create Maker Spaces, which can supplement, and in some cases replace, the conventional teaching laboratories, and encourage students to develop prototypes.
- **Translation of intellectual property:** into viable products and start-up ventures through the support of **business incubator**, culminating in technology transfer to industry and/or deployment in society.



We will expand operations of the university Patent and Technology Licensing Office (PTO) to enable seamless transfer and distribution of technologies developed within Amrita. It is our goal to be listed on the Reuters 100: The World's Most Innovative Universities, which looks at institutions that filed 70 or more patents with the World Intellectual Property Organization. The planned new innovation ecosystem is expected to increase the number of international patents granted from 5 per year to 10 per year in 10 years and 20 per year in 15 years.

3 International

International is the 3rd pillar of ascent for Amrita's attainment of world ranking. The international partnerships will enable interdisciplinary research as shown in the **5 Is** diagram. Capitalizing on our international partnerships, Amrita will inspire our students

and researchers to be able to provide solutions to global problems. Through the existing as well as the **150 new** collaborations planned over the next 15 years, our students and faculty will have ample opportunities to get trained in, experience, and get elevated to research and academics of international calibre. Another direct benefit is the flow of international faculty into Amrita leading up to **30%** of faculty and **25%** students strength.

All of the above activities are expected to give a significant impetus for research that is internationally relevant and recognised. This is consequently expected to have a direct impact on both publication quality and citations, thereby directly addressing objective 3.2, and the following characteristics : 4.1.i, iii, iv, viii,

Leveraging the numerous international connections of our academic leadership that begins right from our Chancellor, we set ambitious goals for our international collaborations.

- **Collaborations:** We have set a target for collaboration with top 500 ranked universities in the next 10 years - 100 and the Target for collaboration with top 500 ranked universities in the next 15 years - 150.
- **Team Teaching and Linked course:** Team teaching approach will be initiated with the international partners for up to 10% of courses in the first five years. This will involve two or more faculty members from Amrita and the International Partner University. The linked course approach involves a cohort of students taking two or three courses that are linked by a theme, taught along with international partners. About 10% of the total courses shall be taught by this method in the first five years.
- **Research:** Remodel the Ph.D. program pathway with international research

training. All Ph.D. students would have a co-guide/doctoral committee member from an international university. Introducing a new approach to international experience through **dual Master's, dual Ph.D., integrated Master's programs leading to 94 such programs in 10 years and 116 in 15 years.**

- **Accreditation:** Target academic programs to be internationally accredited. Outcome based education will be standardized across all academic programs which will also be the basis for future accreditation by **NBA, ABET**, and AACSB. We are on target to be **AACSB accredited** by the year **2019**, covering both our MBA and Ph.D. program. Starting in **2018**, both **B. Tech.** and **M. Tech.** programs will be accredited by **NBA** and select programs will be accredited by **ABET** in **2019**
- **World class faculty:** We will strive to achieve an International faculty proportion of 30% in the next 15 years. In our current academic programs, we will have at least one course taught by an international faculty. In 5 years, **5% of courses in every programs will be taught by International faculty, 10% in ten years, increasing to 15% in fifteen years**

Next 15 Years

- 150 New international Collaborations**
- 30% International Faculty**
- 25% International Students**

- **International Academic Advisory Board (IAAB) with distinguished academic leaders from world class universities.** IAAB members from Asia, Europe, Africa and the Americas will advise the Amrita leadership on how best to organize and build world class universities with a specific focus on research and to expand the university's global reach and impact. This will also allow us to 'benchmark' with the best international practices. Amrita will launch the first formal meeting of the IAAB in the summer of 2018 with distinguished leaders from SUNY Buffalo, UC San Diego, & UC Davis.
- **Students:** Amrita International Fellows under the **Chancellor's scholarship** scheme will be identified on the basis of merit and potential, as well as their ability to help us achieve our strategic vision, including our commitment for societal benefit. With about **2%** of our students being foreign, we intend to significantly increase this to about **15% in the next ten years.** The International students will comprise both short term and long term students. Short term will consist of Certificate Programs, Student Exchange, Medical Observer-ships, Live-in-Labs, Summer Programs, Internships, etc. Foreign and domestic students pursuing Ph.D. at Amrita will be given scholarships. Students will be mentored for global competitions like the ACM ICPC, XPRIZE, DEFCON Ethical hacking.
- **Global Alumni Network:** We will launch initiatives designed to provide opportunities for international alumni living and working around the globe to reconnect with one another, with current and prospective students, and with the university. Amrita Global Alumni Ambassador Program, Alumni

boot camps, Alumni development program, and Alumni giving, will be few of the initiatives targeted in the first five years. We intend to formally launch international chapters in USA, Australia, and Europe, and to institute Alumni awards by 2021.

- **Amrita Global Centres:** We plan to open Global Centres in key parts of the world. In the first 10 years our targets are **San Ramon (California), Chicago, New York, Melbourne, Singapore, and Frankfurt** expanding to 5 more centers in 15 years. These locations for the gateways will capitalize on the strengths of Amrita's connections across the globe through study abroad programs, international students, faculty teaching and research, university partnerships and alumni.

I⁴ Industry

Industry is the 4th pillar of ascent for Amrita's world ranking for IoE. The innovations in the university will enable technology transfer to industry. The university has demonstrated success both in transferring technology to industry, and of realizing real world deployments in concert with industry partnerships. The participation of industry in our board of studies and research committees has led to students being prepared to be globally competitive, and a large number of students are sought after by multinational corporations. Industry has been the primary beneficiary of Amrita's academic and research pursuits.

In the coming 15 years, the university plans to engage in several new academic and research programs that will significantly redefine the way industries operate and innovate. This opens up for us a huge opportunity to engage with industry partners. We will offer

customized courses focused on improving the skills of the employees of our industry partners, including up-gradation and training paths. We foresee potential joint research centers with Industry given their recognition of Amrita's influence in helping them to increase efficiency, reducing costs, and improve their bottom line, opening new possibilities for industry growth.



In the coming 15 years, we plan to create **30 new industry-academia joint centers** from our current 12 centers. As new industries evolve, we anticipate incubating some of these within Amrita's TBI program by offering our patent portfolio to strengthen industries, and offer technology transfer programs for seamless translation of research outcome to commercial products. All of these industry interfacing activities help in reviving the economy as traditional jobs are outmoded by automation, and as India prepares itself to become the third largest economy by mid-2030s.

The above activities will also address the objectives of the IoE, outlined in 3.2, 3.4 and 3.5, and further elaborated in sections 4.1.v, 4.1.x, 4.1.xii

Target World University Employability Rankings and Produce Global Ready and Highly Employable Graduates by Incorporating Industry 4.0 Skills.

With internationalization being a university-wide priority, we intend to have at least 30% of graduates employed globally within the next five years. It is our goal to significantly improve the employer reputation and be in the Top 500 world class universities for

employability within the next ten years.

Scale Industry Engagement with Multinationals for Continuing Education for Professionals, Research and Consultancy.

We intend to expand our continuing education programs. Currently we have research collaboration with about 20% of our industry partners. We have plans to increase this number to 50%, 75%, and near 100% in the next 5, 10, and 15 years.

I⁵ India

The pillar of “India” is about Nation Building. At Amrita it is an operational guideline to orient our efforts toward nation building. The **5 Is** diagram shows that the innovations in the university and the industry will have a major societal impact in India.

Since its inception, Amrita has consciously chosen to commit its research activities to resolve the most basic and pressing problems of India’s society by providing technology solutions. Our innovative rural development program managed under **Live-in-Labs[®]**, plans to adopt more than 101 villages, at least 2 in every state in India, with the goal to devise sustainable solutions for significant challenges in areas of energy, water, hygiene and sanitation. This program has attracted participation from more than **250** international students and faculty.

In terms of serving India’s well-being, Amrita’s research programs will continue to support the national development initiatives of the present Union government including **Swatch Bharat, SWAYAM, Digital India, Make in India, Namami Gange, Skill India, Open Defecation Free.**

The above activities address the objectives of IoE mentioned in 3.4 and 4.1.vi, 4.1.xi,



Provide opportunities for faculty and students to take part in meaningful experiential learning via Live-in-Labs[®]. We intend to scale the program to involve over 500 faculty and students per year.

Validate ancient Indian wisdom through spirituality and modern science. One of the most important dimensions of all around human and societal development is spirituality. To give the younger generation an opportunity to study, learn, imbibe, practice, and spread the essence of the wisdom of our scriptures, rishis and God realized masters, Amrita will be expanding the new International Centre for Spiritual Studies -- Amrita Darshanam, with various Ph.D., Masters, and Humanities courses. Built into the curriculum, all our first year students will learn a yogic approach to life through a credit course.

Nurture innovation and research culture in K-12 and make them STEM-Ready.

Amrita has a proven record of mentoring K-12 schools, teachers, students in both formal school settings and rural settings, to be STEM Ready. We will be organizing DST INSPIRE camps, IEEE Symposium with Maker Workshops, Programming and Ethical Hacking competitions for senior secondary students. In partnership with State Govt. and CBSE, we intend to conduct teacher-training workshops in 10,000 schools in the next five years in topics like Educational technologies, Computational Thinking, Robotics, Life Skills and Cyber Security.

Vocational Training for capacity building in aid of National Level programs including digital India, skill India and ‘Open-Defecation-Free’. Target is to produce **300 courses in 15 years.**

Part 1. III d

SWOT analysis of the institution/university focusing on its present status in the quality hierarchy and the proposed measures to address the shortcomings.

Strengths

Unified purpose: An inspired group, whose dedication & commitment is a direct motivation, personified by our Chancellor, Sri. Mata Amritanandamayi Devi.

- Fairness and transparency in governance: Every faculty and student has direct accessibility to the Chancellor, who is the highest decision making authority for the university. This brings in unprecedented fairness, transparency, as well as accountability.
- Education: Amrita specializes in value based education that integrates knowledge, morals, and commitment to profession and society.
- Interdisciplinary Research: Amrita engages in a significant interdisciplinary research that has led to ground breaking developments in medicine, education, health care, and sustainable living.
- Multi-disciplinary programs: Prepare students to address diverse sets of problems in various disciplines.
- Multi-campus: Allows us to attract the best faculty/student talent from across India. Ability to mentor new campuses to come up to speed rapidly on the high quality trajectory.
- International: Parent organization has a large international presence which allows us to network with eminent institutions, attract exceptional faculty from abroad, and provides student/faculty exchange opportunities.
- Experiential and immersive learning: Curriculum allows the students and faculty to spend extended time in rural areas, understand the true nature of the problems and develop a deep desire to solve the problems through innovation, research and practice.
- Employability: An educational process that admits students of diverse educational and social backgrounds, and transforms them into employable and creative individuals. Top ranked entrepreneurship program is creating employment generators.
- Digital DNA: Amrita pioneered digital & on-line learning leading to nationally adopted platform such as A-VIEW. Digital learning has become part of our DNA.

Weakness

- In the age of aggressive marketing, being a societally conscious organization, sometimes Amrita's marketing practices are seen as conservative.
- Perception of Amrita being a place that adheres to value system and discipline may discourage a certain type of student from joining.
- Amrita's emphasis on research culminating in societal benefit may dissuade some researchers who regard publications as the sole outcome.

- Having the not-for-profit operating model limits the funding opportunities that Amrita's PIs conceptualize.

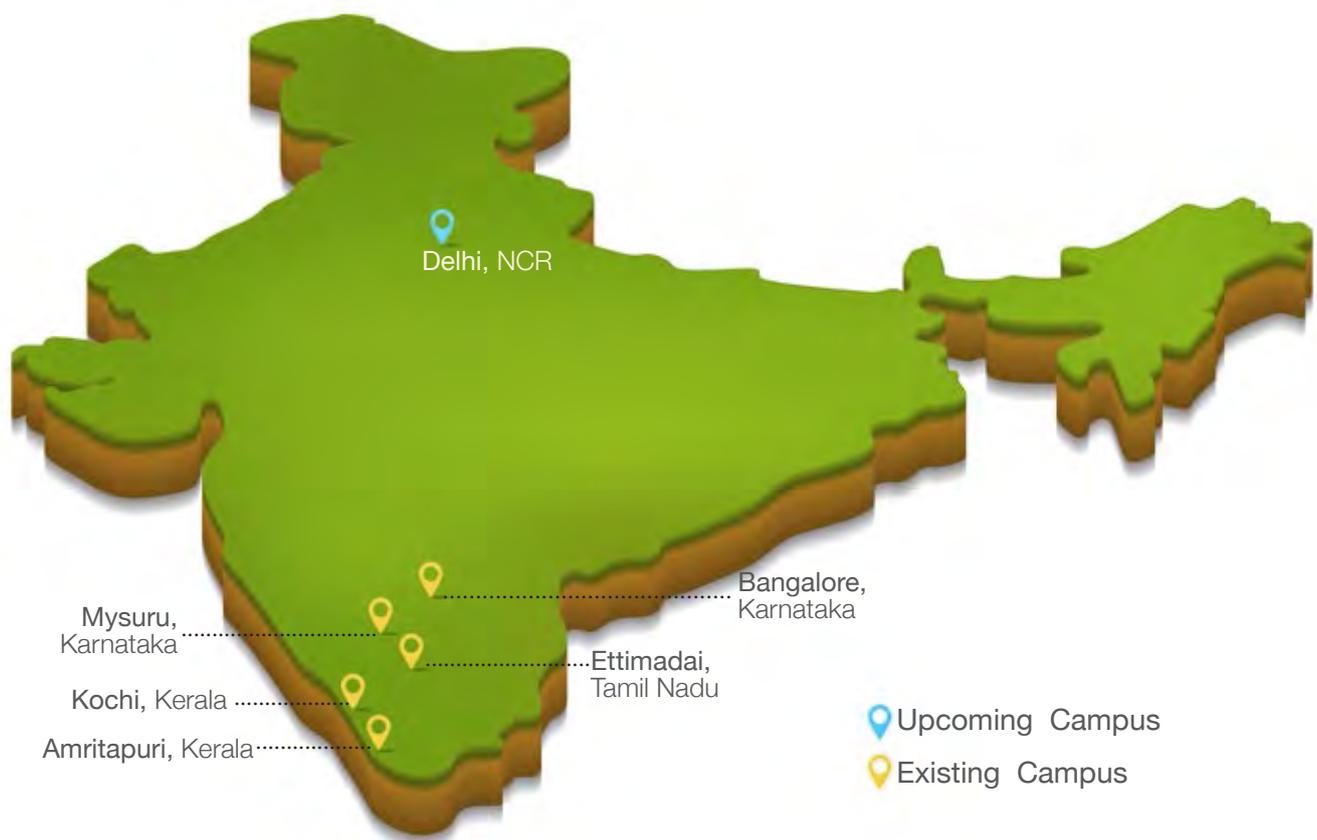
Opportunities

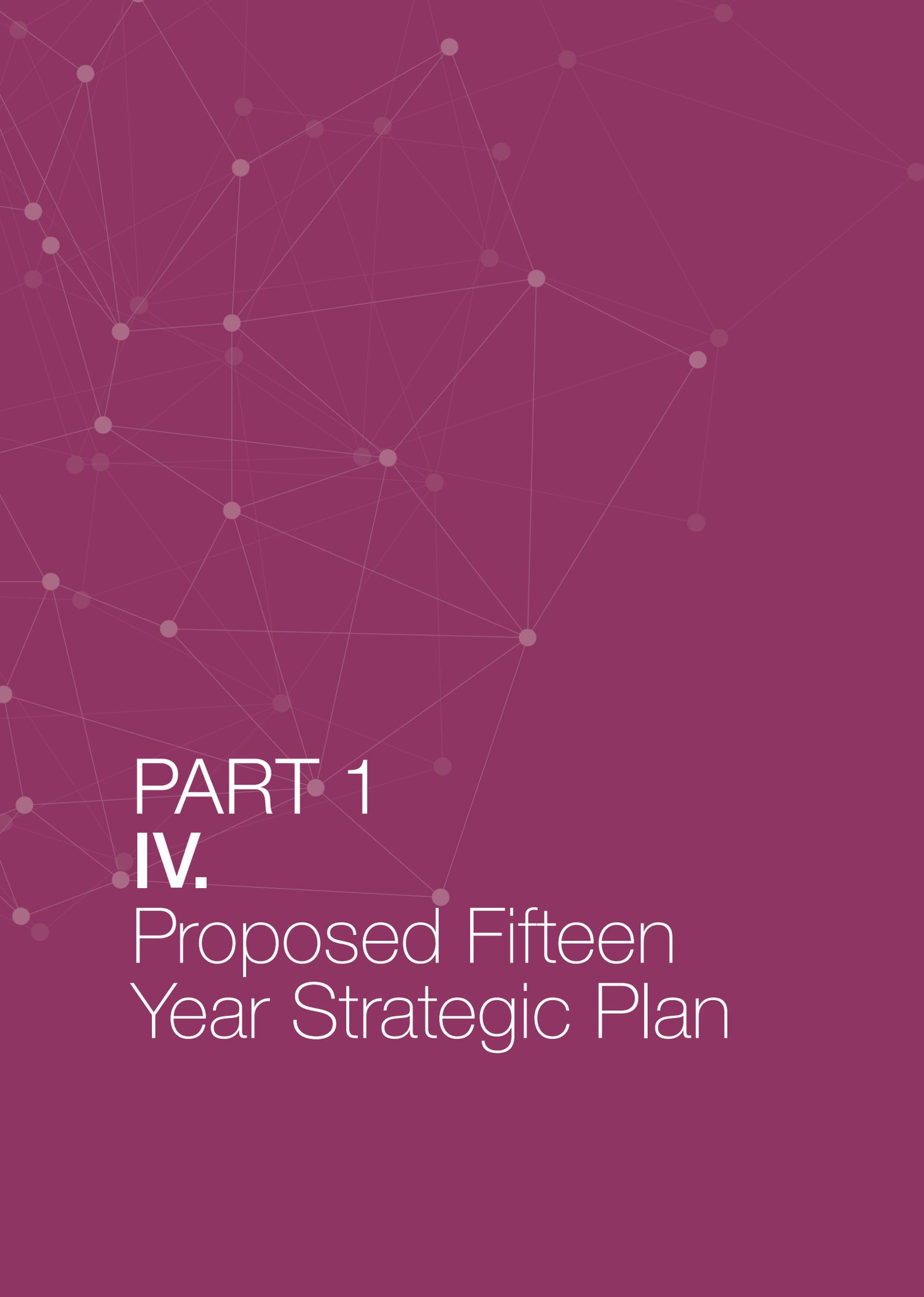
- Our parent organization has paved the way for the university faculty and students to apply innovation and research in a large number of adopted villages and disaster relief activities.
- Our super-specialty, all-digital hospital provides unprecedented opportunities to apply the latest engineering and technological advancements towards healthcare, one of the grand challenges of the millennium.
- Leverage close proximity of industries in Tier I (Bangalore) and Tier II (Coimbatore, Kollam, Kochi) cities, & help students actively involve in academic programs, research projects, and internships.

- Amrita's confirmed expansion plans into new geographies will increase our national reach and foot print.
- Being a young university allows us to be nimble in bringing in modern approaches to academics and research (e.g., micro and nano credits, interdisciplinary programs) without legacy issues

Threats

- National shortage of Ph.D. holding faculty has an impact in our quest for continued improvement in quality
- Local government bodies curtailing growth and expansion.
- Excessive regulations in some of the programs are limiting our ability to introduce multi-disciplinarity aspects into our programs.
- Being a private university, access to research funding opportunities from governmental agencies is limited





PART 1
IV.

Proposed Fifteen
Year Strategic Plan

Part 1. IV. a

An academic plan showing the courses proposed and a research plan focussing on current thrust / niche area(s) of expertise and proposed plan in pursuit of excellence in those areas.

Academic plan addresses the design, delivery, assessment and outcomes of the teaching learning process. In today's world, past knowledge is becoming obsolete and new knowledge is being created at an unusually rapid pace. Additionally, we recognize that today, the classroom is not limited by four walls – rather, with the advances in information and communication technologies, it has truly become global in the way it serves as an ideal platform for interaction and learning across vast geographical areas, and diverse fields of knowledge, instantly.

In order to adequately cater to this dynamic environment, an academic plan should be flexible enough to quickly accommodate the changes while maintaining the exacting rigor and depth. In parallel, a research plan must not only keep pace with the changes, but always think futuristically, while being grounded in humanitarian values. Thus, the academic and research plans should

be seamlessly integrated such that new discoveries and technologies are brought into the classroom setting and communicated to the students to give them a leading edge.

New learning spaces should integrate lecture delivery with thought provoking discussions leading to collaborative learning which fosters critical thinking, innovation, problem solving and teamwork. While building strong professional bonds, our faculty and students help each other progress by collectively bridging knowledge chasms, exemplified by nature's marvels, the fire ants that build bridges across chasms in progressive coordinated motion.

As an answer to the above needs we present our academic plan consisting of the three dimensions of flexible curriculum, personalized learning and interdisciplinary graduation pathways, followed by our research plan structured on interdisciplinarity, innovation and international standards.



The development of the academic and research programs starts with the identification of a thrust area of research, having an evident connection with India's developmental needs and priorities. At this stage, the university provides support to the researcher by way of seed grants. The researcher builds on this support to obtain sponsored researcher grants, and upon further maturity, this paves the way for establishing a center of excellence in the broad thrust area. Subsequently, development happens in four directions:

1. New academic programs are initiated: first, postgraduate programs linked to the niche

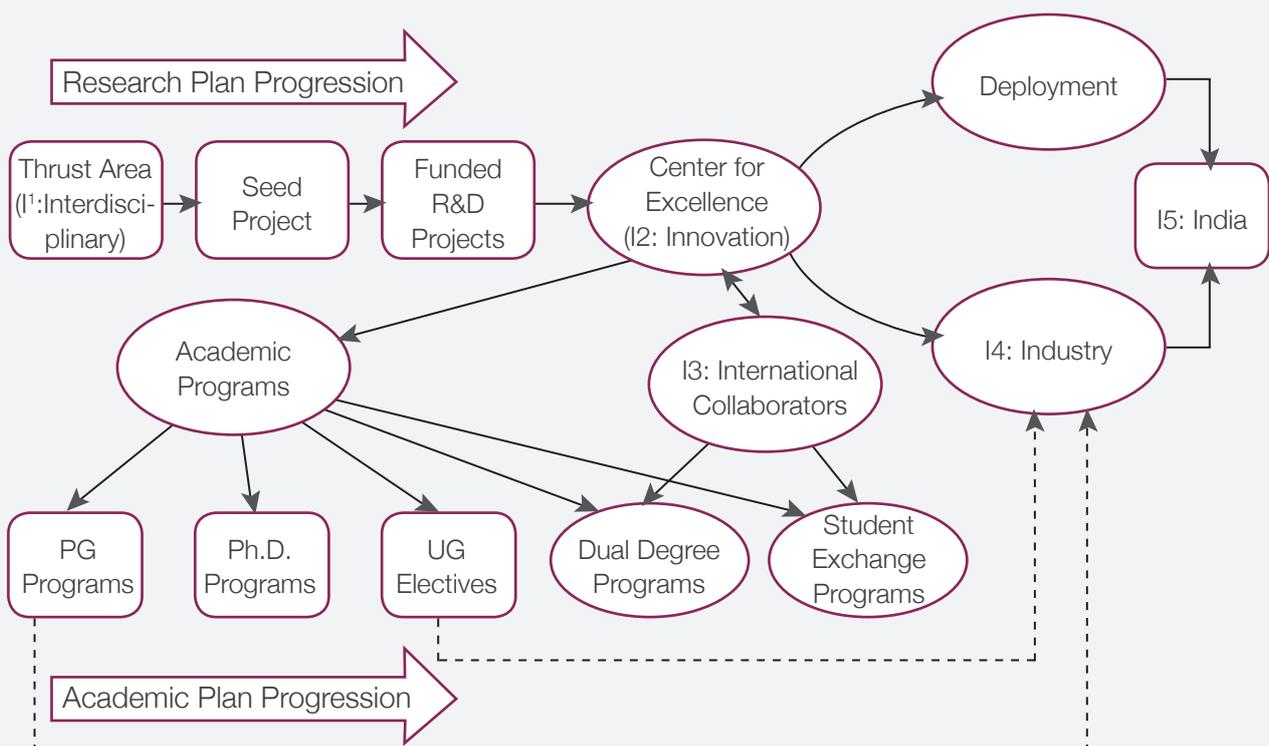
areas are started, which then feed into the establishment of doctoral programs, and in parallel also create & offer undergraduate electives,

2. Collaborations are enhanced with institutions of International eminence (Dual Degree programs, Student Exchange programs, joint authorship, bilateral proposals, membership in consortia)

3. Results of the Innovations lead to knowledge transfer and are deployed for societal impact in India, and

4. Technology transfer from the Innovations to the Industry partners results in Make in India initiatives.

As outlined in the vision, mission and goals section, Amrita's academic and research thrust is based on Interdisciplinary initiatives. The diagram below shows the strategy and the synergy between the research plan and the academic plan.



Academic Plan

The sections below cover the various new types of integrated and interdisciplinary programs. Each program can be customized by students to suit their goals. A snapshot of the three 5-year plans are presented below followed by the academic strategy (ADAPT) which is designed to execute the plan.

Plan for Years 1 - 5:

The following table shows the 5-year plan for Years 1 to 5. These courses are based on the research thrust in the research plan. The table has several rows each of which is a theme for the type of programs that will be offered. The various themes are Masters programs, Integrated degree programs, International programs, Dual degrees, program offerings in new campuses.

Masters	Integrated	Bachelors
Data Science & Business Analytics	Integrated PhD in CS, Wireless, CyberSecurity	Yoga & Management
Innovative Engineering & Entrepreneurship	MD/Ph.D in Healthcare Informatics	Commerce (Business Entrepreneurship)
Analytics for Healthcare	MD/Ph.D. in Imaging	Agricultural Studies
Cyber Physical Systems	Bachelors/Masters Programs (BTech + Masters, B.Sc + MBA; B.Tech + MBA)	Engineering Disciplines in new campus (Amravati): Computer Science, Mechanical, Electronics and Communication, etc..
Energy Technologies	MD/Ph.D in BioMedical Engineering	MBBS in new campus (New Delhi)
Human Computer Interface	MD/Ph.D. in Tissue Engineering	BSW in Rural Development
E-Learning Technologies	BTech+MS in Chemical & Environmental Engineering	BSW in Generic Social Work
Educational Pedagogy	MD/Ph.D. in Vascular Intervention	BSc in Rural Technologies and Social Innovations
Yoga & Psychology		B.Arch. in Architecture with Focus on Rural, Eco-friendly and Indian Vernacular Architecture
Public Policy & Governance		
Women's Studies		
Computational Biology		
Agricultural Studies		

207
EXISTING
PROGRAMS

10
SCHOOLS

1:12
FACULTY
STUDENT RATIO

The following table shows the plan of the international collaborations for the academic programs. All the collaborations of the programs mentioned below are between Amrita and the international institution. Note that these programs are later explained in the section Graduation Pathways.

Integrated (BTech + Masters)	Dual Masters	Dual/Joint PhD	International Masters with Industry
UC Davis (3+2)	University of Buffalo (MBA+MS)	University of New Mexico	Parallel and Distributed Computer Systems (VU, TCS)
Ecole Centrale de Nantes (3+2)	University of Buffalo (MTech+MS)	University of Buffalo	Energy for Smart Cities (KTH, ABB)
University of Manchester (3+2)	Grenoble INP (MTech+MS)	POLIMI	Wireless Networks & Applications (University of Twente, Keysight)
Grenoble INP (3+2)	UPC Spain (MTech+MS)	University of L'Aquila	Embedded System for Automobiles (UB, Bosch);
University of Zurich (3+2)	VU Amsterdam (MTech+MS)	VU Amsterdam	Global (TU Munich, UCSD, Maxim Integrated, Xerox, TEOCO)
University of New Mexico (3+2)	University of Twente (MTech+MS)	University of Trento	Industrial Management (Grenoble INP, L&T)
Uppsala University (3+2)	University of Ireland (MTech+MS)	KTH	MBA (RMIT, Genpact)
Politecnico di Milano (4+1)	University of Paderborn (MTech+MS)	RMIT	
University of Mannheim (BTech/ MBA)	Aalto University (MTech/MS)	UPC Spain	
	University of Missouri (MBA/MS)	University of Tokyo	
	Colorado State University (2+2)	Colorado State University	

Plan for Years 6 - 10:

The table below shows the academic plan for the second 5-year time period. This plan mainly contains post-graduate programs in a variety of areas with international and industrial collaborations.

Masters	Smart Grids
	Hardware & Advanced Manufacturing
	Disaster Mitigation
	Integrated Medicine
	M.A. in Development Studies and Technologies
	M.Sc. in Disaster Management and Geo-Informatics
	M.Sc. in Climate Change and Environment Sciences
	M.P.H. in Public Health Systems and Technologies
Integrated	MD/Ph.D in Global Health
International Integrated Programs	Technical University of Mannhiem (3+2)
	University of Texas at San Antonio (3+2)
	Ryerson University (BTech/MBA)
	University of Twente (BTech/MBA)
International Dual Degrees	University of Missouri (M.Tech/MS)
	Aalto University (M.Tech/MS)
	Dual Masters in Innovative and Sustainable Chemical Engineering
	UCDavis (2+2)
	UNM (2+2)
International Dual/Joint PhD Degree	Uppsala University
	Monash University
	Newcastle Unniversity
	Ryerson Universty
	University of MIssouri
	UC Berkley (Sustainable Technologies)
International Industry Degree Programs	Dual Masters in Business Analytics (NIU, IBM)
	Dual PhD in Robotics (EPFL, L&T)
	Integrated Masters in Biotechnology (UW, ID Genomic)
	Integrated Masters (UCSD, LUPIN)

Plan for Years 11 - 15:

The academic plan for the 3rd 5-year time period is shown in the table below. This plan mainly contains postgraduate and doctoral programmes in a variety of areas.

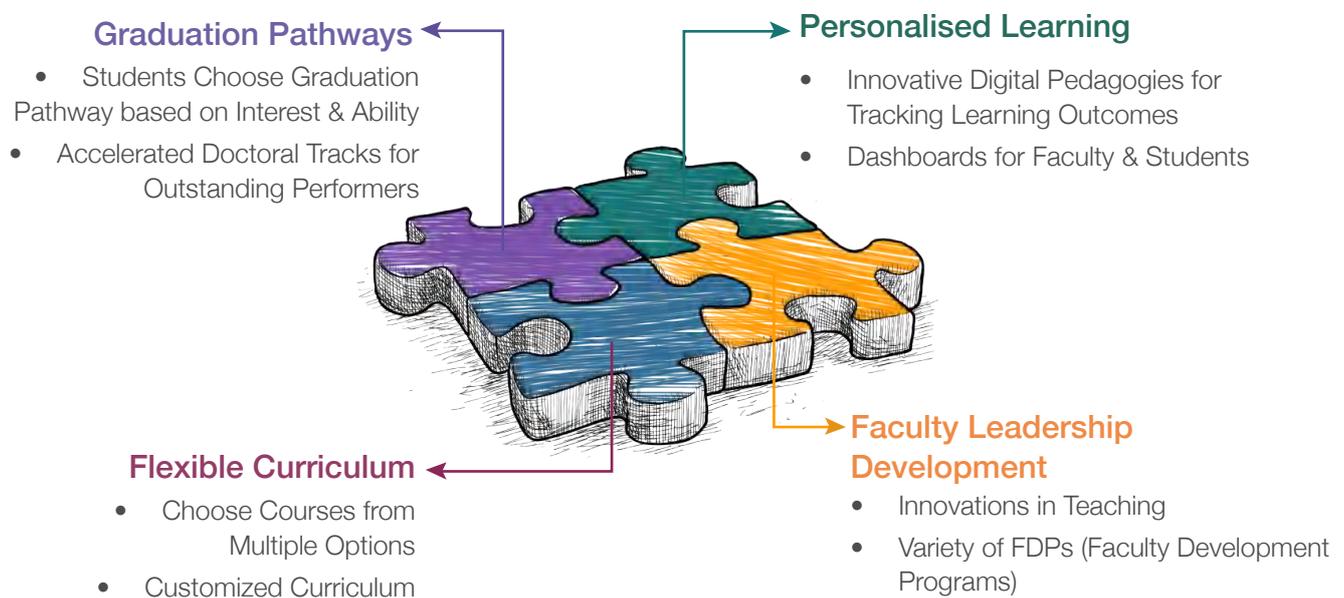
Masters and Doctoral Programs	Hardware & Manufacturing
	Technologies for Sustainable Energy
	Water & Sanitation
	Doctoral Program in Women Studies
	Doctoral Program Educational & Development Studies
	PhD in Integrated Medicine
	PhD Programs at Amravati Campus
	DM Programs at Delhi Campus
	5 year integrated M.Phil. /PhD programme will be offered in interdisciplinary areas of Humanitarian, Natural Sciences and Relevant Technology
Integrated	MD/Ph.D in Nano Bio Medicine
International Integrated Programs	LUND University (3+2)
	UCLA (3+2)
	UC Irvine (3+2)
International Dual Masters Degrees	Newcastle University
	University of Zurich
	Columbia University
International Dual/Joint PhD Degree	Aalto University
	Penn State
	EPFL
	ETH Zurich
	University of Toronto
International Industry Degree Programs	Dual PhD in Business Analytics (NIU, IBM)
	Integrated Masters in Bioinformatics (VU, SAP)

ADAPT: Amrita's Distinctive Academic Plan for Tomorrow

Amrita's Academic Plan is named ADAPT, with the clear intent that it should be flexible; so that each student is able to reach their goals according to their interests and abilities.

ADAPT is the architecture for Amrita's futuristic academic plan. Emphasis will be on providing an outcome-based education that is learner-centric with flexible curriculum and several graduation pathways. Personalized learning will enable students to take responsibility for their progress. To enable these paradigms, proactive faculty that will take leadership in emerging areas will be provided with continuous training and opportunities.

The ADAPT architecture focuses on four key academic strategies as shown in the figure. Looking ahead into the next 15 years, ADAPT will steer Amrita in interdisciplinary programs and degrees. ADAPT is supported by an online Personalized Curriculum Planning and Learning system to cater to the diversity in students. ADAPT will be a catalyst for the paradigm shift of bringing students into the center of the educational ecosystem.



The ADAPT architecture focuses on four key academic strategies as shown in the figure above.

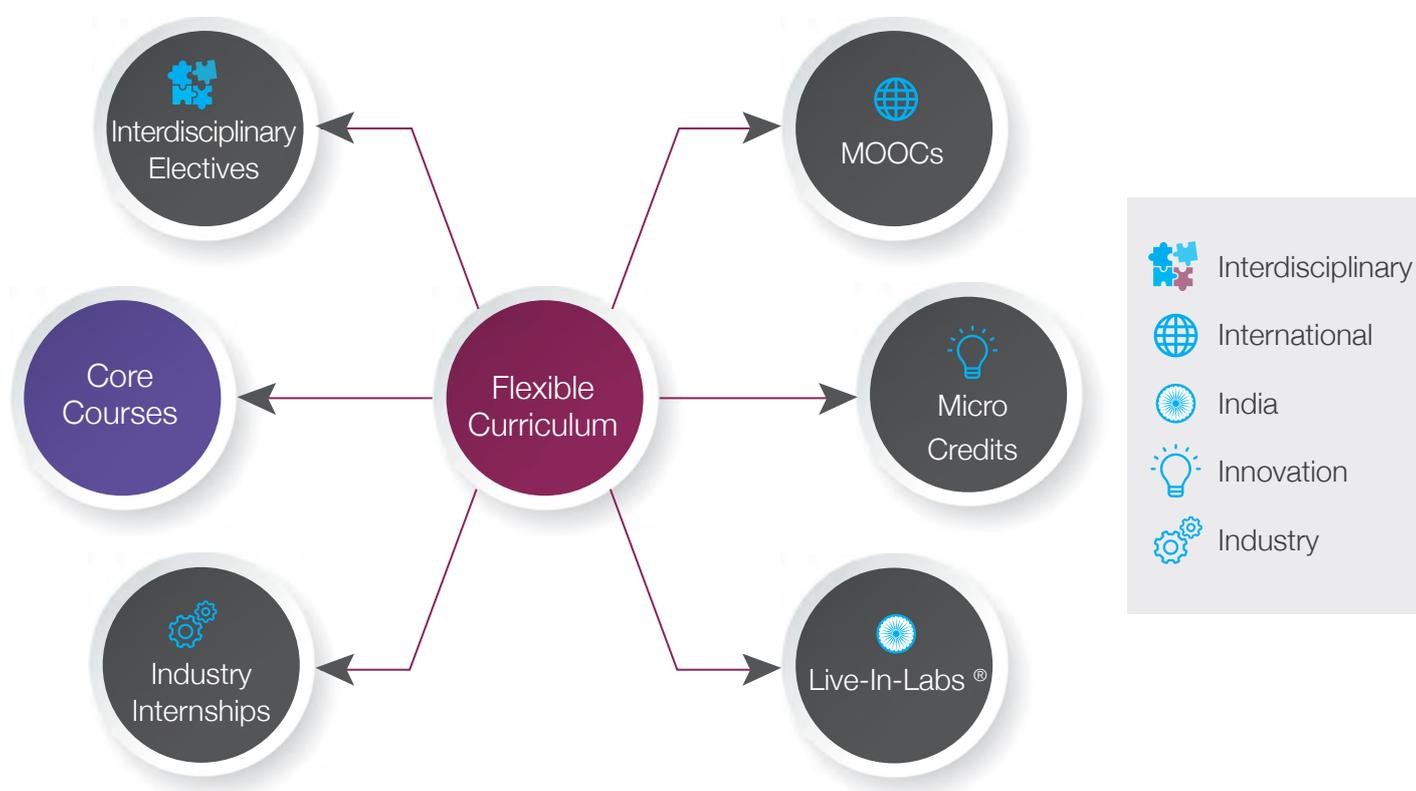
Flexible Curriculum

The various programs within ADAPT will be designed with flexibility in mind; the students will set their own academic goals, and the academic advisors will help the students plan coursework to meet them.

The Curriculum is revised regularly with a focus on the quality and relevancy of the contents, with due consideration of the skill sets of the future. Besides regular courses, certificate courses as well as career oriented

courses/programs will be offered to assist the students with career opportunities.

The flexible curriculum system ADAPT allows students to select courses from several sources. Based upon the student's goals, preferences and performance; ADAPT recommends the set of courses that are relevant for each student. Some of the sources to select courses for the programs are as follows:



The following quote illustrates Amrita's philosophy that all students should get the best possible education according to their personal interests and ambitions.

"Every student has a special ability to succeed in some area or the other. The key is to find a way to identify the area of interest and the inherent ability of the student. The education process lets the student blossom in that area and be successful. We admit students from all backgrounds, and the academic plan is created to transform them, so that each one succeeds. The ordinary has to be transformed to extraordinary by the academic process."

Core courses:

The core courses & labs offered across the programs build on the foundation for offering a flexible curriculum. All interdisciplinary electives and MOOC courses and labs are linked to core courses.

Interdisciplinary courses:

Interdisciplinary courses are being offered at UG and PG level to the students to explore learning opportunities in relevant fields outside their core areas. The university also leverages its strengths in virtual laboratories, and international & industrial collaborations for high quality delivery of the courses, to create high learning impact.

Internships:

Internships in academic, industrial, or social projects create an opportunity for students to supplement their classroom knowledge with applications. Students are encouraged to pursue internship and exchange opportunities with the top 500 ranked universities and are assigned credits at Amrita. In the Semester

abroad internship, students spend a semester at a partner university to gain project-based research experience.

Online courses:

This curricular provision also enables students to take recognized online courses offered in SWAYAM, Coursera, and other MOOCs & digital labs as part of their chosen learning portfolio.

Micro course:

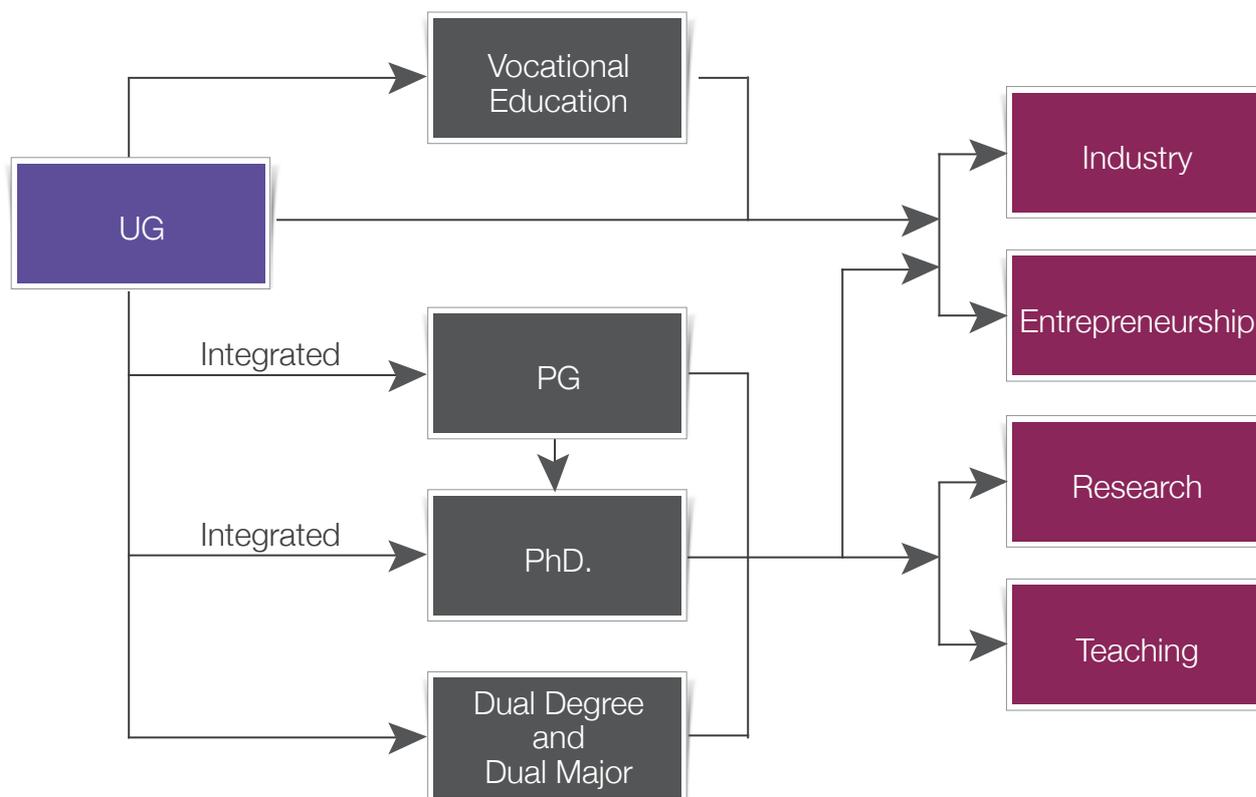
The micro-courses are designed to be short 1 or 2 credit courses offered by experts from the industries and international institutions. Micro-courses are excellent vehicles for professional certification courses.

Live-In-Labs:

The Live-in-Labs program for students encourage them to learn experientially. Here, students identify the challenges in rural villages, and work in interdisciplinary teams to apply their knowledge and skills for improving the quality of life.



Graduation Pathways



Key Highlights of UG / PG /Ph.D. Programs:

The figure above shows how the students can traverse various graduation pathways for advanced degrees leading to careers in research, teaching, industry and entrepreneurship. We plan to introduce new degree granting pathways for outstanding students:

Integrated Master's is an accelerated program which allows the UG students to register for masters courses, and seamlessly merge into the master's program.

Integrated Ph.D is an accelerated program which allows a masters student to seamlessly continue for a Ph.D.

Bachelor's and Ph.D. allow exceptional students who demonstrate early creativity and penchant for research to directly set Ph.D. as their target while they are in the midst of their bachelor's program.

Dual Degree, Multiple and Broad specialization:

International Dual Degree Programs: Students can earn an additional foreign degree from an acclaimed international partner university.

Dual Major-Minor Programs: Amrita believes that in the future almost all students would require a major degree in the core discipline along with a minor in the application area. This will be a big boon to inter-disciplinary programs, even to the extent that medical students could be choosing a data science / health informatics minor.

Vocational branching and merging: In order to accommodate students who may have increased aptitude towards skill based programs, at any juncture of a student's trajectory, the student may opt to branch into vocational education cluster. In addition to basic skills training in the

chosen vocational field, this program can also be multi-disciplinary: innovative haptic technologies for building training modules, entrepreneurship for starting small businesses, etc..

Our pilot efforts in the last couple of years has already begun to pay off returns: hundreds of unskilled unemployed rural women have gotten trained as plumbers,

Additional Centres and Programs:

AMMACHI Labs

Amrita Multi-Modal Applications and Computer Human Interface Labs (AMMACHI) is an academic and research center at Amrita University that brings an interdisciplinary approach to addressing societal challenges. The lab creates innovative vocational educational tools and skill development solutions to help uplift entire communities. The Lab offers a PG program in Social Work, and PhD programs in development studies and implementation sciences.

The Center for Gender Equality and Empowerment is a research focused academic center for promoting gender equality and fostering women's empowerment with a special focus on technology and other innovative methods. The center holds the prestigious UNESCO Chair in Women Empowerment & Gender Equality. For its field work, it partners with the university's wide initiative Amrita SeRVe (Amrita Self-Reliant Villages) which was launched in 2013 and has ongoing development activities in over 100 villages adopted by Mata Amritanandamayi Math. The adoption of key focus areas of intervention by Amrita SeRVe such as health, water and sanitation, agriculture, education, eco-friendly

carpenters, etc.. This has attracted nation's biggest construction company L&T to partner in starting a training school for the plumbing and carpentry on our campus. Also, from vocational streams, students who start as vocational trainees can traverse into core scientific/engineering disciplines (e.g., lateral entry of a vocational diploma holder to a mechanical engineering B.Tech program).

infrastructure, income generation, and self-empowerment has set in motion a ripple effect in our academic and education systems with the involvement of students and faculty in rural internship programmes in different regions and contexts. There is a strong move towards developing and expanding our current academic programme to include community and rural based development studies with respect to the seven focus areas of intervention outlined above.

Operating under the faculty of humanities and social sciences, AMMACHI Labs and the UNESCO Chair in women empowerment and gender equality are well-poised to deliver strong results by way of research and development related to implementation sciences, development studies, women's studies, global health, social work, and applied anthropology.

Amrita Darshanam, Centre for Spiritual Studies aims at providing a complementary course of education for students to mold themselves into well-developed human beings. In the academic programme offerings, the research focus includes the health benefits of Yoga, Meditation, Indian Art Forms, Cultural Studies, Indian Philosophy and the interface of Objective and Subjective Sciences.

Agriculture: The intent of this centre is to train students in the field of Agricultural Sciences to deliver the needs of emerging India. The students would be empowered to carry out research in agricultural sciences, of an interdisciplinary nature. Amrita's expertise in several fields like biotechnology, microbiology, nanotechnology, modelling, agricultural business, remote sensing and satellite data interpretation and engineering enable innovations modern agricultural practices.

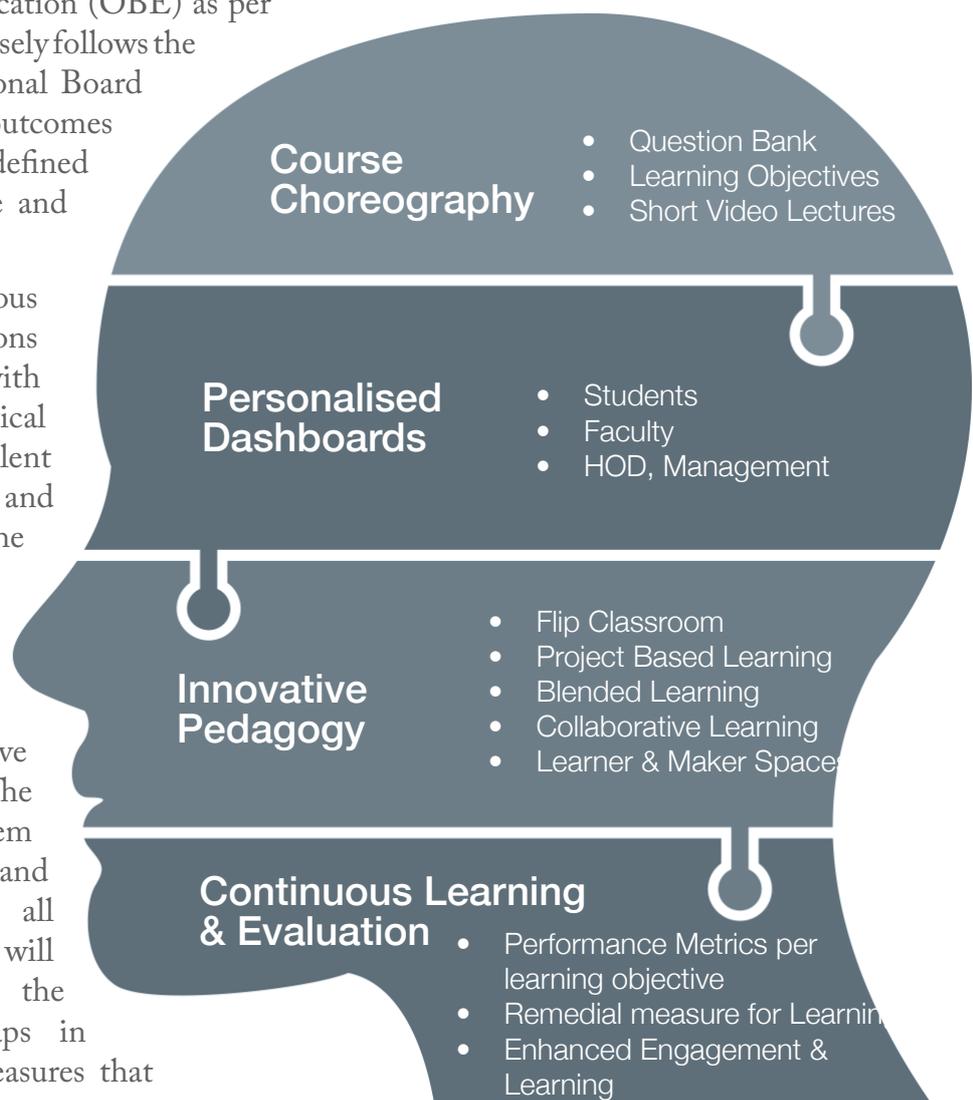
The university has established a strong foundation of academic and research work with respect to developmental studies, with added focus on inclusive development (rural self-reliance, and women empowerment). This has placed the institution on a firm trajectory of high-value contributions via developing and deploying holistic and integrated research solutions incorporating social, technical, business, and economic dimensions.

Personalised Learning in ADAPT

The entire personalized learning framework in ADAPT is based on Outcome Based Education (OBE) as per the Washington Accord, and closely follows the recommendations of the National Board of Accreditation. The learning outcomes and objectives will be clearly defined and measured using formative and summative assessments.

The objective of the various innovative pedagogy interventions is to produce students with problem-solving & analytical thinking; teamwork; excellent soft skills; leadership; and values for societal benefit. The diagram outlines the 4 major components which support the Personalized Learning.

Overall, for various courses and classes, various innovative pedagogies will be employed. The goal is to create an ecosystem of Continuous Learning and Evaluation (CLE) where all the students and faculty will be continuously aware of the assessments, the specific gaps in learning, and the remedial measures that will be undertaken.



Our pilot studies have shown that such an approach where learning takes places regularly is immensely beneficial to the students since it reduces the stress, the anxiety, and the effort need during the exams. At the same time, the learning environment would be designed to keep high achieving students engaged. The overall intent would be to get actionable insights into learning and teaching performance in order to enhance teaching-learning processes and outcomes.

Course Choreography:

This pedagogical approach will consist of designing courses with clear learning objectives, large question banks and video lectures. As much as possible, creation of this content will be done in collaboration with existing national initiatives like SWAYAM & NPTEL. Faculty will be encouraged to participate in cooperative learning and interactive lectures using A-VIEW Virtual Classroom platform.

Innovative Pedagogy:

While there is significant emphasis on interdisciplinary programs and courses, pedagogy and innovative learning methods supported by technology are also very important. The following pedagogical approaches will be merged into the courses and classes in a phased manner.

Blended Learning:

This is normally a combination of the conventional instruction and online learning. We will extend Blending Learning to have combinations of flipped classrooms, Technology-Enabled Learning (TEL), and peer-coaching.

Collaborative Learning:

The teacher becomes the enabler so that

learning can take place between groups of students. The teacher serves the role of facilitator enabling peer-teaching, group discussions, peer editing, and collective problem formulation. Another associated model is the think-pair-share method.

Learning Spaces:

Learning spaces are the new classrooms where a variety of blending learning pedagogies like flip classroom will be implemented. Such learning spaces would be flexible so that the the layouts can be changed according to the requirements of each session integrating lecture delivery, in-class assessment and group activities. These learning spaces will also be equipped with digital facilities like cameras, displays, and devices for interaction.

Maker Spaces:

Maker Spaces are key to the engineering disciplines – these maker spaces will be the labs where students will engage in creating new innovative prototypes. Experiments and learning projects are designed by students, approved by instructors, and executed with freedom of schedule, protocol, round-the-clock access and individual/group formats.

Project-Based & Problem-Based Learning (PBL):

Facilitate learning by doing and this is very effective. This includes experience-based environment projects, undergraduate research, and implementation of socio-technological solutions to problems. Students are required to develop conceptual/functional models, create simulations and visual analytics. Hands-on problem solving can be done in a variety of ways for real-world problems to develop analytical and critical thinking skills in students.

There would be continuity and

interconnections among the proposed approaches. For example, blended learning experiences could start with preliminary versions of flipped classrooms This could be strengthened and enriched in the long term,

where an entire course could be taught in the blended mode with an emphasis on deeper learning approaches such as inquiry-based learning.

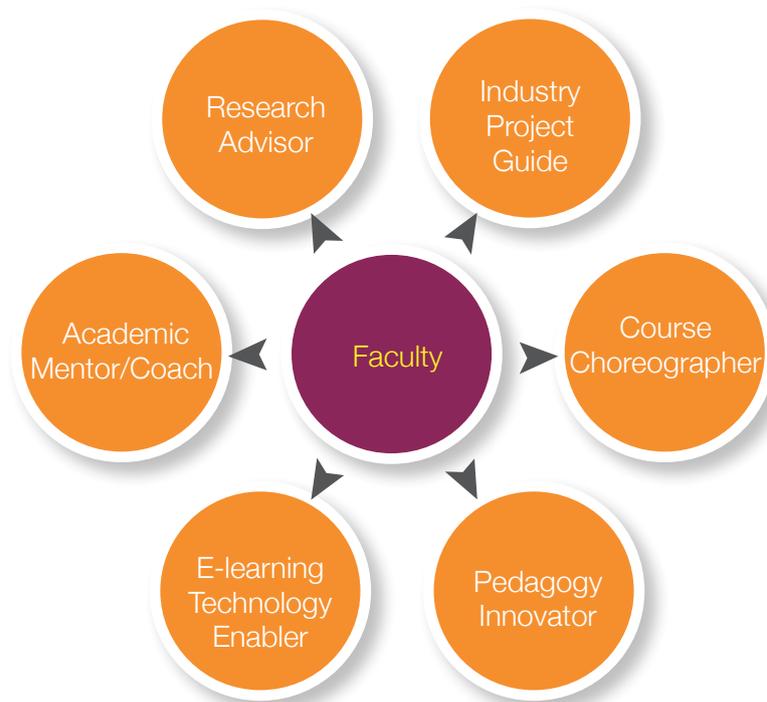
Faculty Leadership Programs

Amrita is acutely aware that development of faculty to become leaders and role models is critical to enhance the quality of the students, the research, and the societal impact.

Amrita will proactively provide faculty leadership programs for a variety of roles that are emerging for research, online education,

and learner-centric pedagogies.

Faculty leadership will be provided for the following roles: Academic Mentor/Coach; Research Advisor; Industry Project Guide; Course Choreographer; Pedagogy Innovator; E-learning Technology Enabler.



Conclusion

This first part of the academic plan shows the proposed courses in 5 year time periods. These unique programs and courses are based on the research thrusts which are in alignment with the developmental needs of India. The academic strategy ADAPT is designed to

create an ecosystem of curricular freedom, expert guidance, and high-quality learning for every type of student. This is expected to transform even the ordinary students into extraordinary achievers.

Research Plan

Founded upon a solid, direct, and collective understanding of the most challenging problems at the local and global level, Amrita has evolved research programs that provide holistic solutions, incorporating factors in the technical, social, cultural, economic, and environmental dimensions. Research efforts have been backed by outstanding institutional support, resourceful encouragement, infrastructure and facilities development, highest ethical standards, and highly interdisciplinary knowledge & skill inputs. The innovation and creation are enhanced via collaborations and partnerships with numerous globally reputed research institutions.

Current thrust/niche areas of expertise:

Amrita has established strong capability in the following broad disciplines: health sciences, science, engineering, management, arts, media & commerce, and humanities & social sciences, characterized by a variety of sub-disciplines spread across five campuses in south India.

We summarize below, the current areas of research under each faculty of Amrita, in which there have been outstanding research and accomplishments. It may be noted that while the research areas are grouped under a specific faculty of the university, they are essentially interdisciplinary and span across two or more faculties.



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CITATIONS

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RESEARCH
GRANTS

Faculty of Medical Sciences

Medicine

The School of Medicine, Amrita Institute of Medical Sciences, has innovative clinical research in oncology, tumorigenesis, transplant medicine, stroke medicine, public health, diabetes, stem cells, regenerative medicine, and neurodegenerative disorders. It is the first in Asia to conduct double hand transplants, first in India to conduct double organ transplant and is a national leader in liver transplant surgery. The school of medicine is also developing innovative heart valves and vascular implants. Amrita's transplant research has put India on the world map in transplants. Research has allowed Amrita to relax donor requirements for transplants thus saving more lives. Amrita is the first in India to conduct a Framingham style 10 year follow-up study to understand the genesis of tumors.

Areas: Clinical research in oncology, tumorigenesis, transplant medicine, stroke medicine, public health, diabetes, stem cells, regenerative medicine, neurodegenerative disorders, heart valves and vascular implants

Nanomedicine

Amrita Centre for Nanosciences and Molecular Medicine has been recognized as a Centre for Excellence under the Department of Science and Technology, the Government of India, since 2006. The Centre has developed first in the world products such as the brain wafer, nanomedicine for drug

resistant leukaemia, contrast enabled bone implant for large size defects, nanotextile implant for pancreatic cancer, nano enabled hyperthermia for liver tumors, a nano vaccine for multiple sclerosis and a low cost Raman-based screening tool for oral cancer.

Areas: Nanotechnology for low cost solutions for cancer, medical diagnostics and tissue engineered medical implants

Biotechnology

In Life Sciences, we aim at excellence in multiple dimensions by pioneering research in a wide spectrum of areas including Cell Biology, Molecular Biology, Cancer Biology, Cell-line Engineering, Wound Healing, Computational Neuroscience, Neurophysiology, Phytochemistry, Proteomics, RNAi, Analytical Chemistry and Venomics. One of the major projects include developing a low cost, automated, insulin pump which was awarded a US Patent in October 2011. Further, attempts to develop an amperometric glucose sensor for coupling with the insulin pump, in addition to a lab on a chip, are also in progress. A US Patent was awarded for the non-enzymatic glucose sensor in March 2017.

Areas: Cell Biology, Molecular Biology, Cancer Biology, Cell-line Engineering, Wound Healing, Computational Neuroscience, Neurophysiology, Phytochemistry, Proteomics, RNAi, Analytical Chemistry and Venomics, low cost, automated, insulin pump, and glucose sensors

Molecular Medicine & Computational Chemistry

Drug discovery, human computer interface, computational intelligence and information system, high dimensional data analytics, Bioinformatics, personalized medicine focused whole genome storage, annotation and analytics, content based indexing and searching tool and unifying the design of heterogeneous systems, computational mapping of genotype-phenotype

Faculty of Engineering

Wireless Networks & Applications

The Centre for Wireless Networks and Applications (WNA), has deployed the world's first comprehensive wireless sensor network system for real-time monitoring and early warning of landslides, in the Western Ghats and in the Himalayas. This work has been awarded a US patent, and has been recognized by the International Programme on Landslides (IPL) and awarded the title, "World Center of Excellence in Landslide Disaster Reduction".

Areas: Wireless technologies for humanitarian relief: real-time warning system for landslides, long range (60 km) wireless internet for off-shore activity, remote patient monitoring, micro smart grids, rural utilities distribution (power and water)

Computer Sciences and Engineering

Computer Science & Engineering provides transformative solutions for a networked society. Diverse set of problems such as security of internet of things, hardware

Ayurveda

The Amrita School of Ayurveda pursues a unique path in blending ancient philosophies and science of health by nurturing a better breed of Ayurvedic physicians, professionally world class and mentally equipped to meet the challenges of the modern world.

Areas: Biomarker evaluations in Ayurvedic therapy, Integrative medicine for HIV-AIDS and Cancer-chemotherapy

security and control systems security, cloud security, early warning framework using core internet protocols DNS and BGP, advanced malware threat intelligence, AIOTM-Secure scalable and interoperable platform for internet of things, semantic web intelligence, healthcare security, backdoor proofing for software, security for networked-embedded systems, analysis of symmetric key cryptosystems, development of secure and authenticated encryption scheme for lightweight applications, predictive threat evaluation in complex IT systems, malware detection using FPGA, sandboxing and machine learning, development of visual cryptographic schemes, analysis of word based stream ciphers, hardware based network intrusion detection systems for high speed networks, error linear complexity measures for multi-sequences, development of methodologies for detection of digital content plagiarism, machine learning and big data analytics for information assurance, big data based security attacks detection system using internet protocols.

Amrita Center for Cybersecurity Systems and Networks (ACSN)

The center has developed a big data

framework that provides the user with an easy to use GUI for analyzing large data heaps. The Centre has also pioneered cybersecurity systems for internet of things (IoT), cloud security, malware threats, embedded systems, cybersecurity addressing the need for secure environment as we move into an ecosystem of digitization, and healthcare.

Computational Engineering and Networking Center (CEN)

This center has developed machine learning and big data analytics for information assurance, big data based security attacks detection, a large-scale multilingual machine assisted translation workbench on the cloud and plagiarism detection system. The Center is actively involved in the areas of Computational Linguistics and Natural Language Processing with a massive translation project to translate web content from English to Indian languages. It is also natural language processing, medical signal and image processing, software defined radio and networks.

Multi-Modal Applications & Computer Human Interface

Amrita Multi-Modal Applications & Computer Human Interface (AMMACHI Labs) is a research center at Amrita University that brings an interdisciplinary approach to addressing societal challenges. The lab creates innovative vocational educational tools and skill development solutions to help uplift entire communities. In the lab's commitment to rural villages of India the lab members are as excited about the continuing development of community outreach solutions as about our focused R&D for CHI, automation, haptic technologies and applied robotics. Areas: Innovative vocational educational

tools and skill development solutions; CHI, automation, haptic technologies and applied robotics for community development

E-Learning

Amrita Virtual Interactive E-Learning World (A-VIEW) is a Virtual Classroom technology where one teacher can interact with thousands of students simultaneously. It is used by over 11,000 institutions all over India. This R&D project has a multi-disciplinary team in E-Learning scalable architectures, mobile applications, pedagogy, image recognition and multimedia content. A-VIEW has received recognition from Cisco as one of the best internet innovations in the world. A-VIEW is being extended for interactive satellite networks..

Electrical Engineering

Renewable energy (solar and wind energies), distributed smart grid development and implementation, grid integration of renewable energy sources with power quality improvement, embedded systems for internet of things and cyber physical systems, design and implementation of efficient millimeter wave transceiver architecture for 5G cellular systems

Aerospace, Mechanical, Civil and Chemical Engineering

Amrita has a strong group of researchers in the areas of novel and advanced materials development – eco-friendly light weight composites and polymer, development of containers for long term nuclear fuel waste storage, thermal resistant materials for space applications, materials for manufacturing, waste conversion to fuel, simulation work and development of unmanned aerial vehicle, transportation and geotechnical engineering, structural engineering, and environmental and water resource management.

Automotive

Automotive Research and Technology Center for Automotive Research and Technology has a focus on solving challenges related to noise vibration and harshness, powertrain development, vehicle handling and lowering SO_x and NO_x emission. It houses state of the art equipments used in industry for automotive subsystems to facilitate joint industry university collaborations in powertrain, emissions, engine performance and vehicle handling.

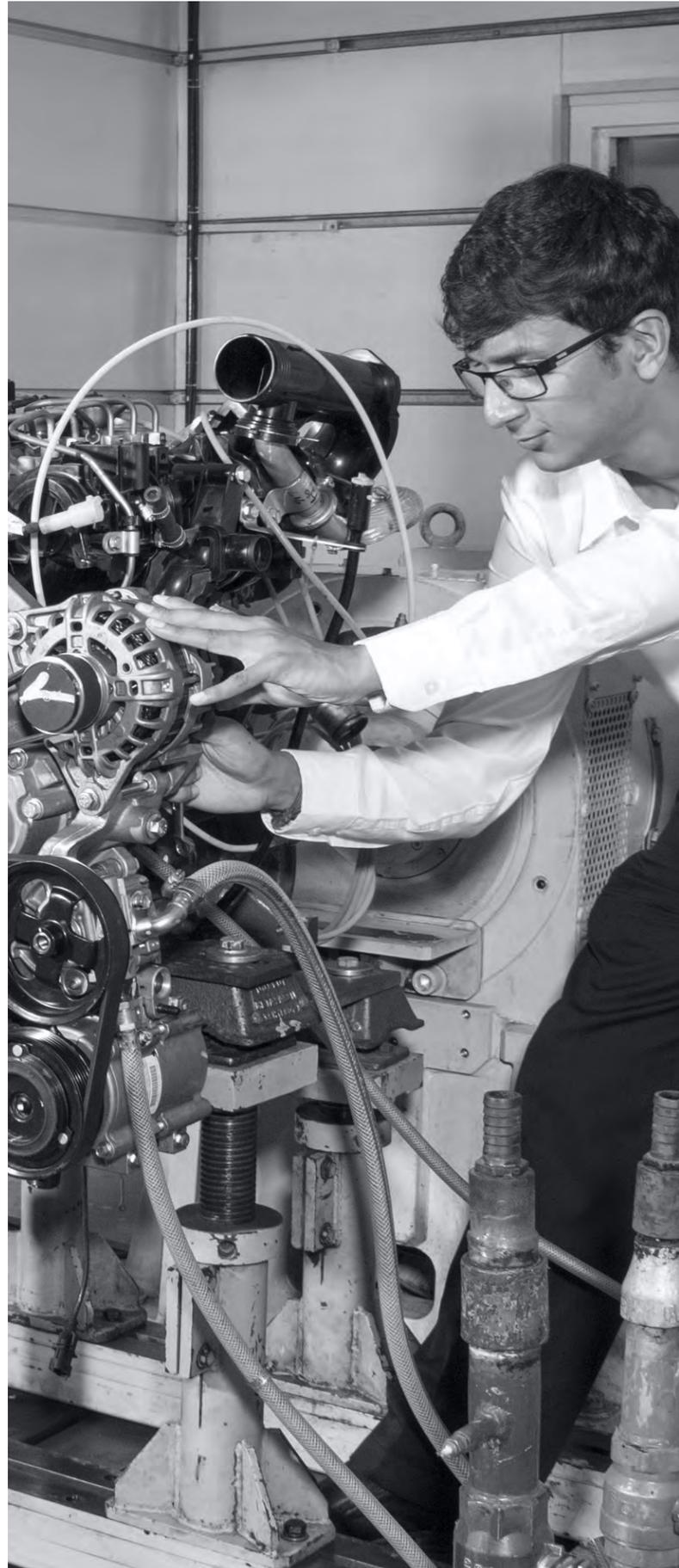
Faculty of Science

Natural Sciences

Fundamental research includes theoretical nuclear and quantum physics, non-linear optics, quantum optics, laser materials processing. Development of lower cost solar cells and biosensors for diabetes are hallmark achievements of the basic sciences discipline. Applied research is carried out in the areas of nano-structured iron-based mixed metal oxide photovoltaic thin films, addressing limitations in organic photovoltaic cells, research on biosensors – cost effective device and cloud enabled smart solution for diabetes care, affordable paper-based microfluidics point-of-care testing device for liver function, biomaterials, corrosion and electrochemistry.

Faculty of Management

In Management Sciences, the School of Business aims at excellence in multiple dimensions by research in a wide spectrum of areas including Healthcare Economics, Governance & Management, Sustainable Development and Climate Change, Economic & Public Policy, Innovation, Social Entrepreneurship, and Business



Analytics for e-Governance. Strong research collaborations with top ranked international universities include the Fish4Food project, a EURO 750,000 tripartite project with University of Amsterdam and University of Ghana, that compares the role of fish in the food chain among the people of three continents and how it can be used towards

alleviating malnutrition.

Areas: Governance Economic & Public Policy, Social Entrepreneurship, Sustainable Future, Workplace experience and Employability, Healthcare analytics, Analytics for e-governance

Faculty of Humanities & Social Sciences

Analytics and Technologies for Education

The center has developed interdisciplinary research-based frameworks and methodologies with techniques such as machine learning, natural language processing, artificial intelligence, and data science to provide inclusive education, personalised intelligent systems, and affordable health solutions. The center has advanced in Barbara Bush Foundation XPRIZE Competition for its Personalized Language Learning solution in the Adult Literacy in the US. The center received the Digital India recognition (Digital Empowerment) from the Hon'ble Minister of MeitY, GoI. The center has developed interdisciplinary research-based frameworks and methodologies with techniques such as machine learning, natural language processing, artificial intelligence, and data science to provide inclusive education, personalised intelligent systems, and affordable health solutions.

Center for Gender Equality and Empowerment

Center for Gender Equality and Empowerment is a research focused academic center for promoting gender equality and fostering women's empowerment with a special focus on technology and other innovative methods. The center will also act as major resource center for the implementation of various development projects undertaken by the institution and the parent organization, M A Math. and holds the UNESCO Chair In Women Empowerment & Gender Equality. Areas: Gender Equity, Women's Studies, global health, Substance abuse, vulnerability mapping



Proposed Plan in Pursuit of Research Excellence

We have identified five interdisciplinary research themes that collectively address some of the most important Grand Challenges which are validated by the importance they are being accorded by many of the top 500 universities around the world. These themes are: Nano-Bio-Medicine, Digital Health, Integrated-Medicine, Hardware & Manufacturing, Sustainability & Resilient Communities, Pedagogy & Learning Technologies, Management Sciences, Health-Sciences - Antibiotic Resistance, Medical

Imaging & Robotics.

For each of the themes, the research plan for the three five-year time periods: 1 to 5 years, 6 to 10 years, 11 to 15 years; is presented in an illustrated manner. At the core of each figure is the title of the well-recognized Grand Challenge. The next shell around the core contains the interdisciplinary thrust areas and the listing on the right contains the 3 time periods with the specific projects that are planned; some of which may be already initiated successfully.

A summary of the interdisciplinarity between the University's faculties (disciplines) and its nine thrust areas is given in the chart below.

	RESEARCH								
Faculty	Medical Imaging & Robotics	Health Sciences	Nano-Bio-Medicine	Smart Manufacturing & Hardware Systems	Sustainability & Reliable Communities	Digital Health	Integrative Medicine	Pedagogy & Learning Technologies	Management Sciences
Medical Sciences	✓	✓	✓	✓	✓	✓	✓		
Science	✓		✓	✓	✓				
Engineering	✓		✓	✓	✓	✓		✓	✓
Management				✓	✓	✓			✓
Humanities and Social Sciences		✓		✓	✓	✓		✓	

With an open policy of recruiting highly qualified and talented professionals, with a passion for engaging in societally important research, the institution has quickly established its strength in various interdisciplinary areas. This process has involved several aspects of the institution's support structure for the facilitation and blossoming of research activity. A strong and unwavering focus on combining academic excellence and humanitarianism, have served to shape and mold the institution's vision, mission, and objectives. Building on this foundation, the institution's management has developed its policies, communications and framework for education delivery in a way that greatly encourages, motivates, and supports the individual and collective research

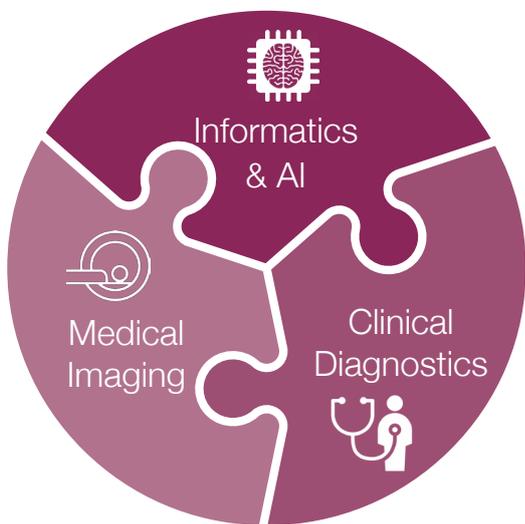
and other academic endeavors, towards common ideals and goals. Within a short span of fourteen years after its establishment as a Deemed-to-be-University in 2013, Amrita has placed itself on the global map through its engagement in various interdisciplinary research areas. We now outline our plans to further advance, enhance and diversify our research base, through highly important and impactful interdisciplinary themes, and the specific focus areas organized laterally and longitudinally within each theme. In each case, the end goal is always the translation of the research activity to technology/knowledge transfer to the industry or for societal benefit in rural and other areas.

Medical Imaging & Robotics

This thematic area brings together the disciplines of medical imaging, informatics and artificial intelligence and clinical diagnostics. This interdisciplinary area brings together clinical specialists, pathologists, interventional radiologists, IT specialists, biomedical engineers, clinical informatics and data analytics who come together to co-innovate and co-create a high precision

diagnostic service for imaging, invasive biopsies, and digital pathology diagnostics with instant consultative capability to any of the networked centres in the globe. Future work in the emerging area of artificial intelligence and machine reading will enhance accuracy in diagnosis, speed of reporting, patient safety and enhance cure rates following ablative therapy.

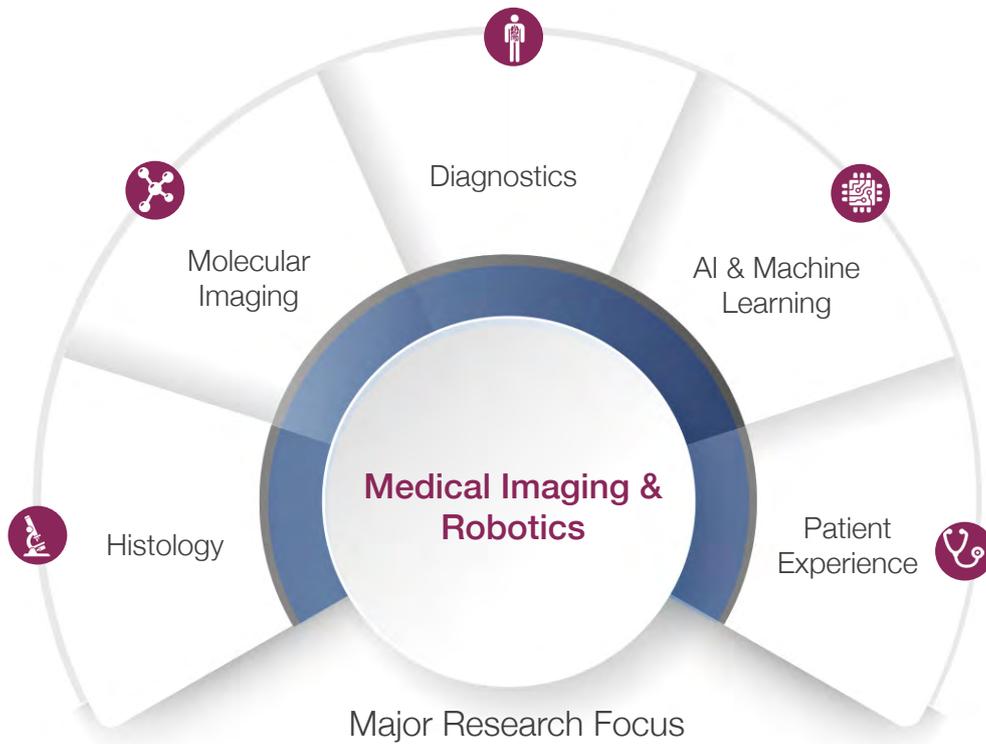
15 year Research Plan



Major disciplines of the thematic area

- Tissue Histology/Tissue Banking and cataloging
 - Proteomic/Studies on fresh tissue and cell receptor
 - High Precision Imaging Studies
 - Digital and Molecular Imaging
-
- Genomic Studies
 - Digital & Tele-pathology
 - Tumour diagnostics and ablative therapy
 - Beta Studies on Robotic imaging and dosimetry.
 - Clinical trials on outcomes and patient experience

First Five Years



- Scale up patient numbers and long term outcomes, mortality and cure rates.

- Genomic Diagnostics
- Machine Reading

Six to Ten Years

Eleven to Fifteen Years

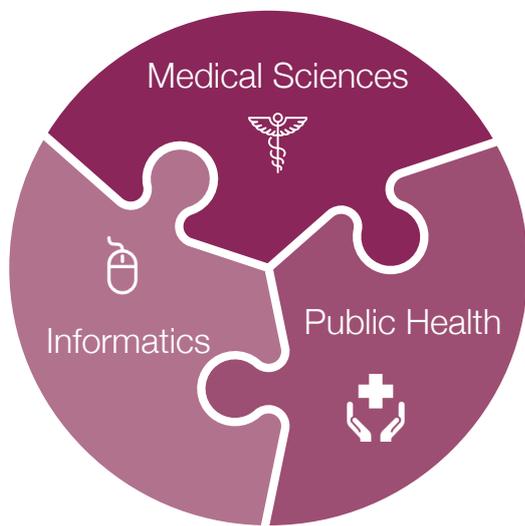
- Scale up of experiences with MI
- Robotic and automated Image acquisition.
- Artificial Intelligence
- Transplant histology diagnostic.
- Scale up of histology involving all tissues
- Radiation dosage studies

Health Sciences - Antibiotic Resistance

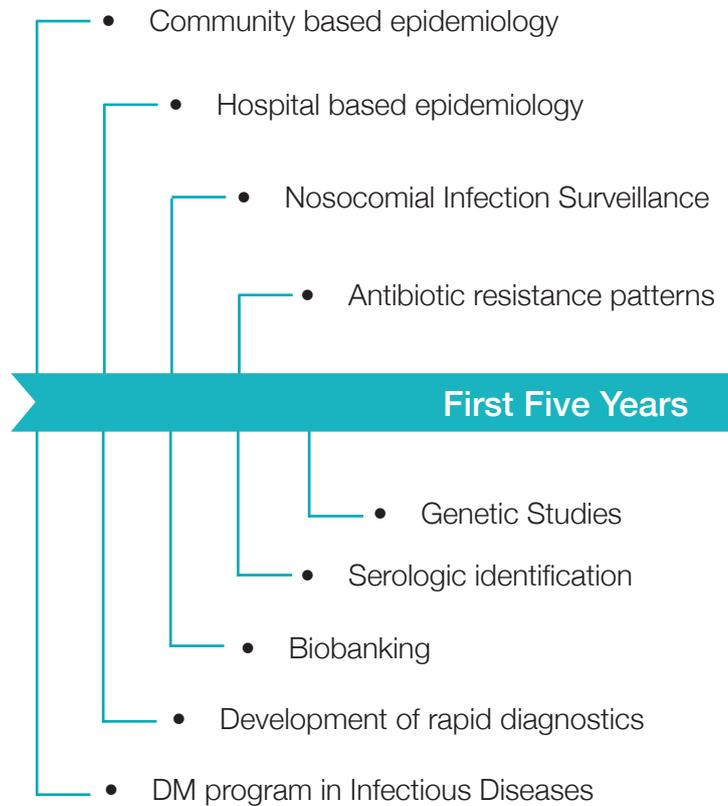
This thematic area brings together microbiologists, physician scientists, clinical infectious disease specialists, molecular biologists, biomedical engineers and IT data analysts to tackle an alarming global crisis, i.e., rapid emergence of multi drug resistance bacteria, fungi, and viral pathogens. This might well neutralise decades of work in developing newer antibiotics with minimal or no side effects. Early detection, precise diagnosis of pathogen and sensitivity to antibiotics, careful scrutiny of emergency antibiotic resistance in the community

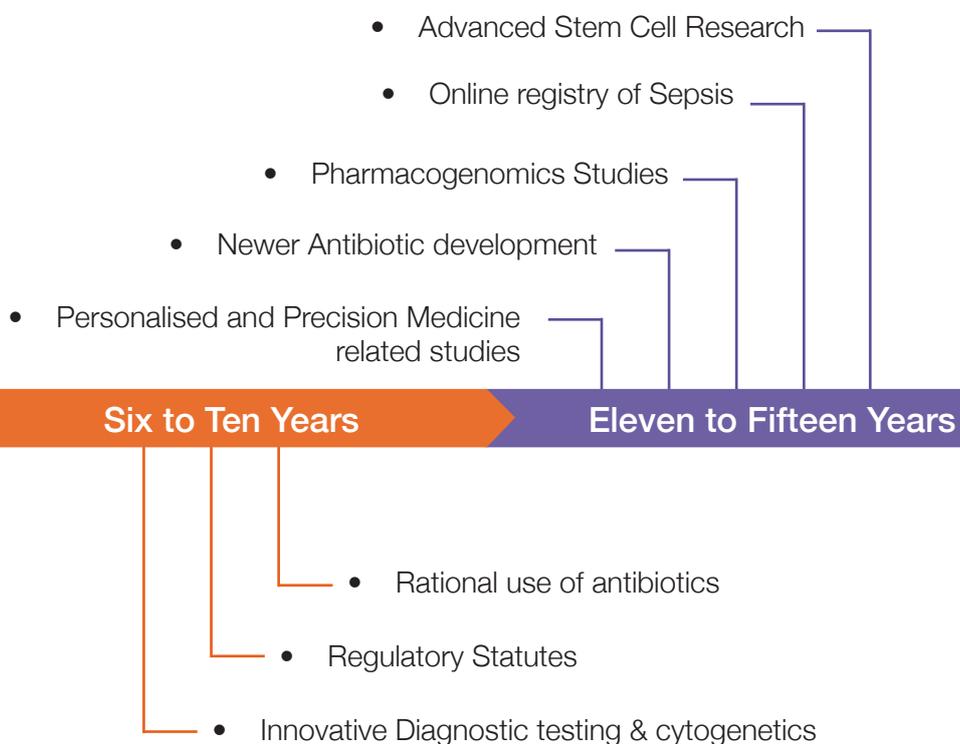
and the rational use of antibiotics by the medical community including pharmacists and public at large will ensure that we as a global community can withstand the onslaught of these deadly pathogens. This is particularly pertinent for India, as we suffer from the highest incidence of antibiotic infection in the world due to the unregulated and indiscriminate use of antibiotics. This underscores the importance of addressing this issue urgently, before it becomes a pandemic.

15 year Research Plan



Major disciplines of the thematic area

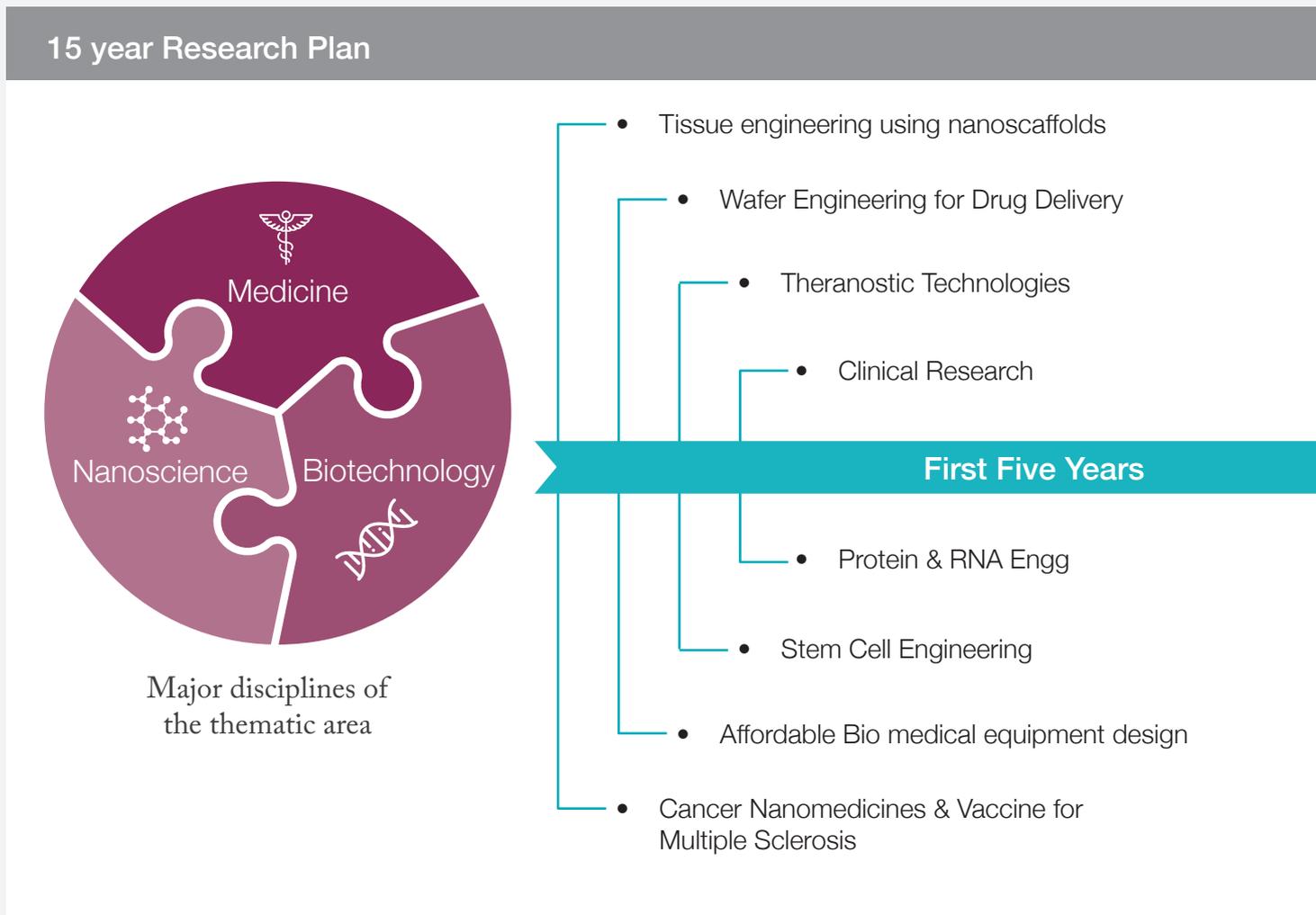


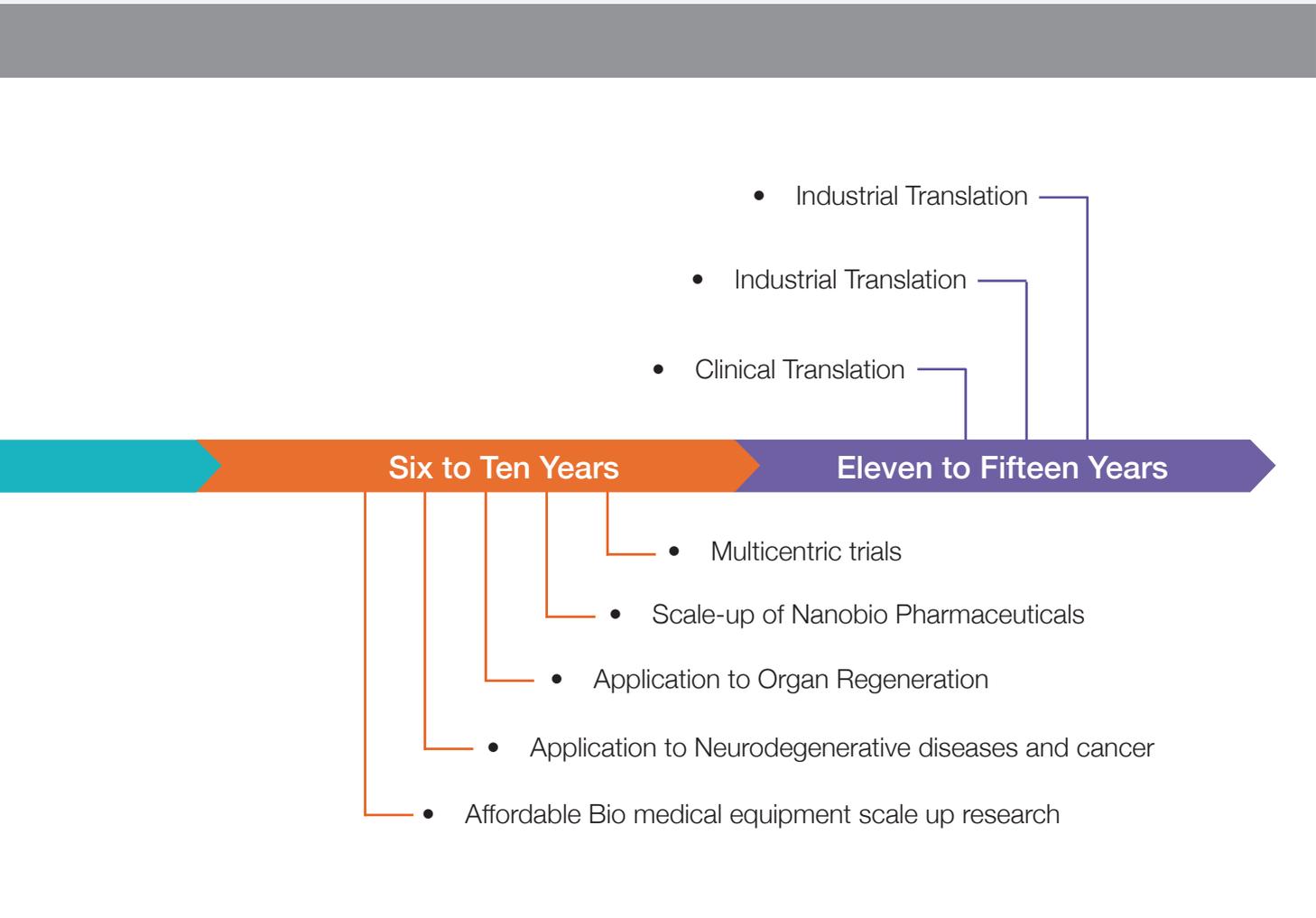
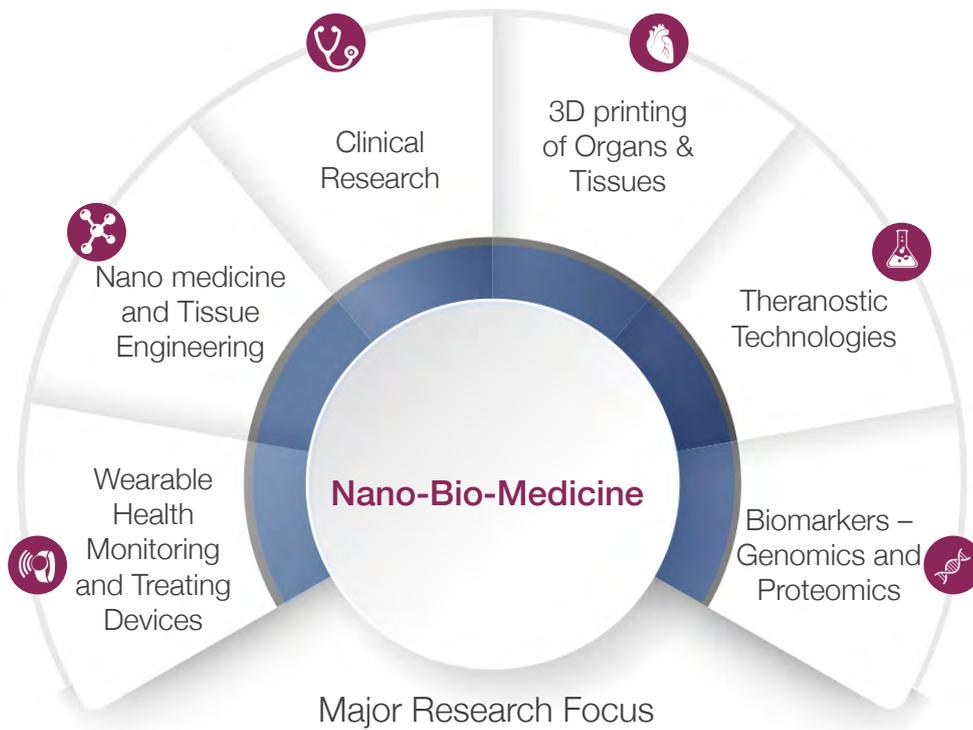


Nano-Bio-Medicine

This thematic area brings together the disciplines of Medicine, Nanotechnology, and Biotechnology. Research in health and medicine are among the most vibrant areas in top ranked universities around the world. This highly interdisciplinary area brings together medical doctors and molecular biologists, IT, networking, & hardware engineers, micro, nano- & bio- technologists, and social workers with compassion &

care. Building on a current world-class research base within Amrita, future work is projected to deliver breakthrough results in nanomedicines, nanomaterials for implants/delivery systems/theranostics, 3D organ printing, clinical research, transplant medicine, epidemiological research, public health and more. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.



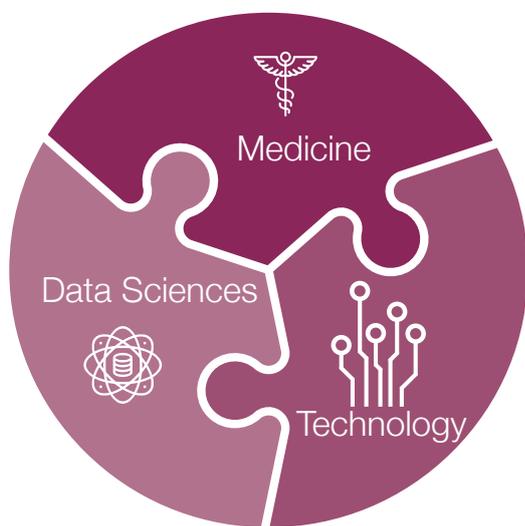


Digital Health

This thematic area brings together the disciplines of Data Sciences, Technology, and Medicine. Strong research teams with health sciences, life sciences, computational, CSE, medical imaging and Machine Learning, provide Amrita a distinct and unprecedented opportunity for interdisciplinary research in drug discovery, data-driven clinical trials, public health, personalized medicine and intelligent clinical decision support systems. Interdisciplinary teams from

Medicine, Public Health, Engineering and Data Science will work together delivering cutting-edge research solutions in the areas of computational drug design, hospital informatics, telemedicine, molecular-based clinical decision support systems, and personalized health monitoring systems. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

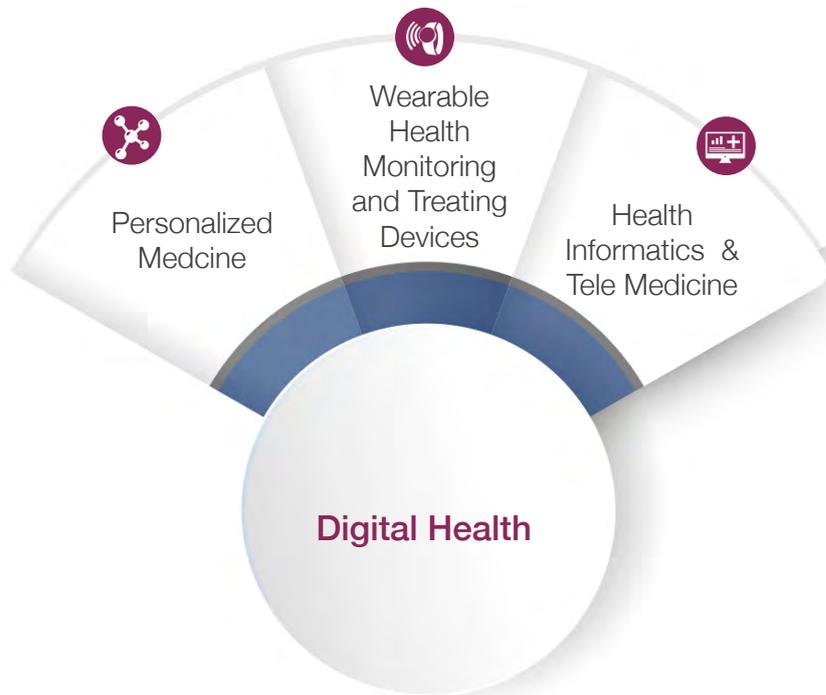
15 year Research Plan



Major disciplines of the thematic area

- Computational Drug Design & Genomics
- Wearables for critical patients
- Medical Imaging
- Health Analytics, Health IoT, & Health Monitoring
- Computational NeuroScience & Neurophysiology
- Low cost sensor systems & body monitoring devices

First Five Years



Major Research Focus

- Comprehensive & Secure Digital Health Platform
- High Performance Medical Modeling & Simulations
 - Deep Learning Smart Health Systems
 - Bio-printed organ transplants
- Predictive Health Demographics

Six to Ten Years

Eleven to Fifteen Years

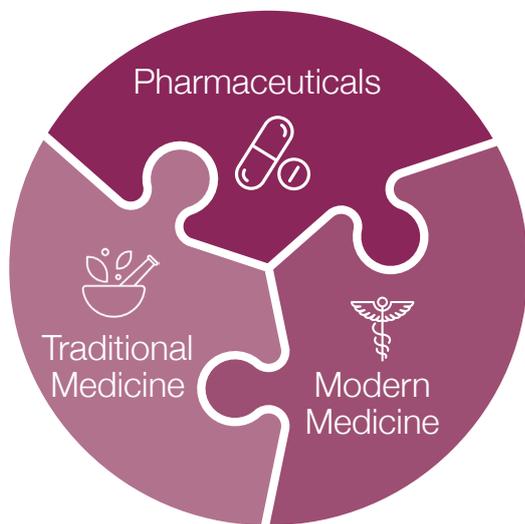
- Intelligent Health Systems
- GPU based compute data center design
- Realtime remote patient monitoring
- Health Situational Awareness & Visualization
- Decision Models & Validation - Regulatory Compliance

Integrative Medicine

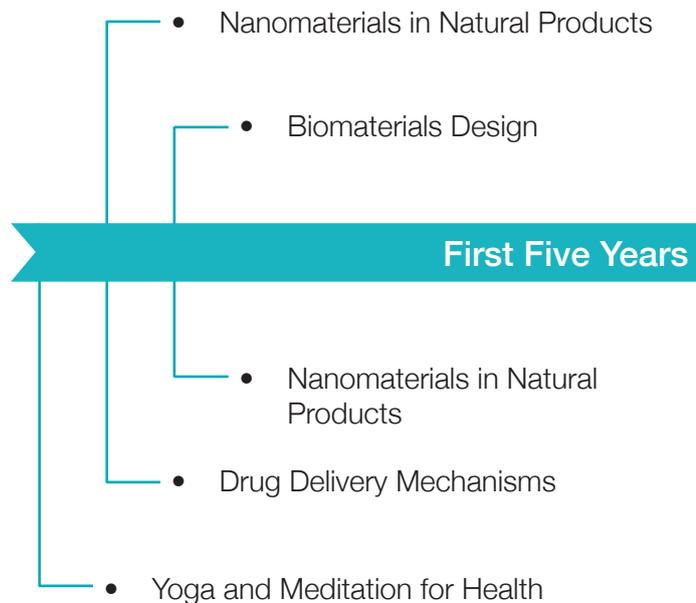
This thematic area brings together the disciplines of Traditional Medicine, Modern Medicine, and Pharmaceuticals. The Amrita Centre for Advanced Research in Ayurveda has set up Amrita Sparsham – Integrative Cancer Clinic to bring the benefits of Ayurveda for improving the quality of life of cancer patients through an integrative approach by collaboration of Ayurvedic physicians and Allopathic doctors. Having

formed a network of over 1000 practitioners and researchers from the fields of modern Medicine, Ayurveda, and Pharmaceuticals through establishment of a professional society and conduction of scholarly meetings, the center explores ways of integrating the three disciplines for enhanced management of health care. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

15 year Research Plan



Major disciplines of the thematic area





- Integrative approaches to lifestyle diseases including Neuro-degenerative conditions
- Continuous monitoring and peronalized preventive medicine
- Phase 2 - Integrative medical trials in HIV/AIDS and Oncology
- Low cost remote Integrative medical centers

Six to Ten Years

Eleven to Fifteen Years

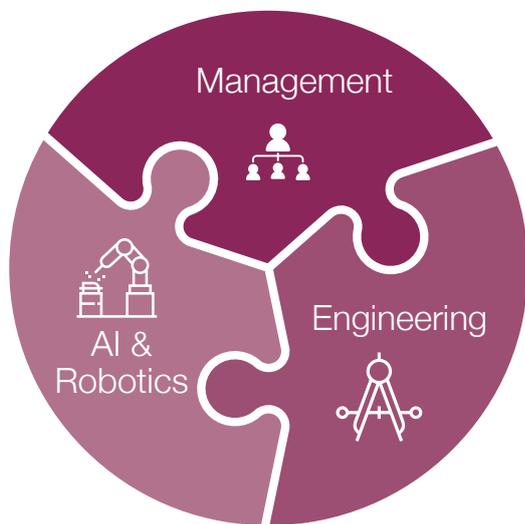
- Organic farming for natural herbs
- Protocols for prognostics in Personalized healthcare
- Integrative medical trials in HIV/AIDS and Oncology
- Natural biofluids, and biomaterials leveraging Bos Taurus Indicus

Smart Manufacturing & Hardware Systems

This thematic area brings together the disciplines of Internet of Things & Artificial Intelligence (IoT & AI), Management and Engineering. Hardware & Manufacturing is given special importance based on the observation that it is practically non-existent in our nation's landscape. Hardware imports exceed an estimated value of around Rs. 200K crores and this is yielding an upper hand to China. If brought back to India, it has the potential to create several million jobs. For instance, in the area of medical

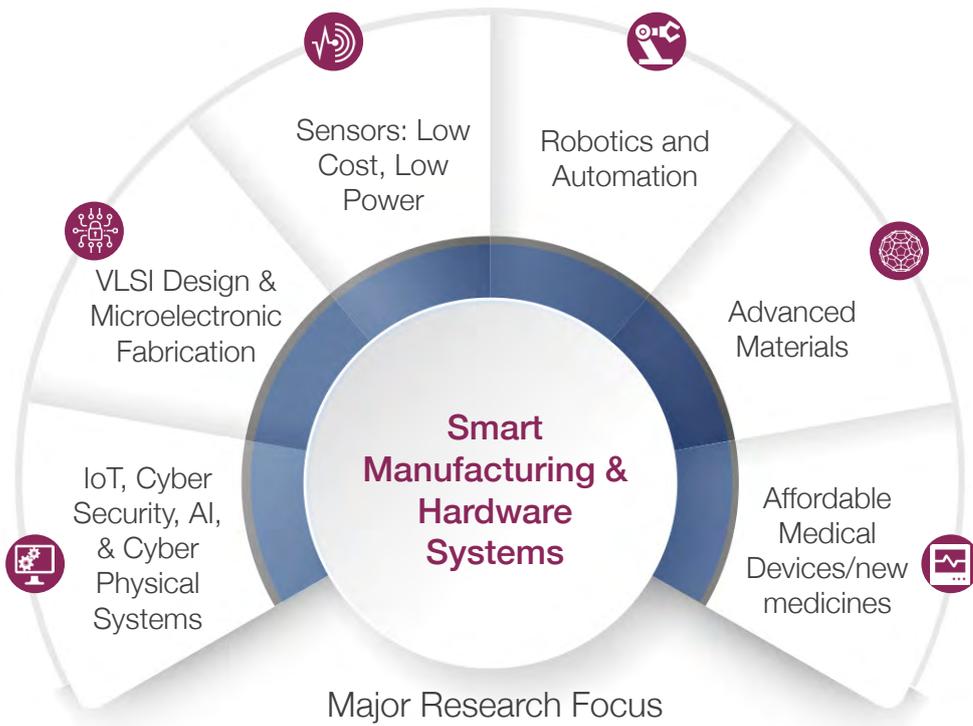
devices, hospitals all over India spend an estimated Rs. 100K crore on annual imports. This is substantiated by our own hospital's requirement of Rs. 30 crores import of biomedical equipment. It is our goal to enable development & manufacturing of such biomedical equipment in India itself thereby saving huge import expenses and ultimately bringing down the cost of delivering healthcare to patients. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

15 year Research Plan



Major disciplines of the thematic area

- Devices and machines for elderly and disabled
 - Haptics, mechatronics and robotics research
 - GMP Manufacturing of Nanomaterials
 - VLSI Design and IoT device development
- First Five Years**
- Materials engineering of fibers and fabrics
 - Advanced Manufacturing and micro machining research
 - Light weight bullet proof materials and blast proof materials.
 - Business process intelligence & management



- Make in India alignment with Frugal Innovation focus
 - Societal Translation focus

Six to Ten Years

Eleven to Fifteen Years

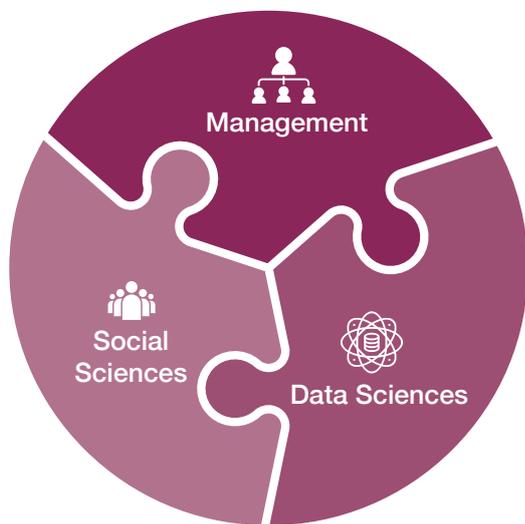
- Scale up of Manufacturing Research
- Electronic fab facility for manufacturing

Management Sciences

This thematic area brings together the disciplines of Management, Social Sciences, and Data Sciences. The broad intersection of Management, Social Sciences and Data Sciences will form a new interdisciplinary approach to address topics like Poverty-Inequality-exclusion, Innovation, behavioural pattern and decision-making, Analytics for Society Business and Policy. Nature of information and data has also influenced the businesses and their approach. Data analytics therefore is becoming a relevant and critical research path to be perused, not for the sake

of it but for societal benefit and affirmative interventions. While the big organizations are vouching for cloud computation and Open sources, others are utilizing such information for aggregation of businesses in different newer ways. Two fall out of these disruptive changes are identified in Innovation as well as value co-creation. It is also important to re-think institutional (both business as well as societal) models keeping sustainability in mind. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

15 year Research Plan



Major disciplines of the thematic area

- Visual Aesthetics and Usability for Smart Devices
- Cross-cultural Behavior and Technology Adoption
- Marketing and Sustainable Consumption

First Five Years

- Big Data, Behavioral Psychology, and Market Structure
- Social Exclusion, Pattern Analysis & Policy Intervention



- Behavioural Nudging, Technology Intervention and Public Policy
 - IOT, Consumer Learning and Market Dynamics
 - Design Thinking, Ergonomics and Aesthetics

Six to Ten Years

Eleven to Fifteen Years

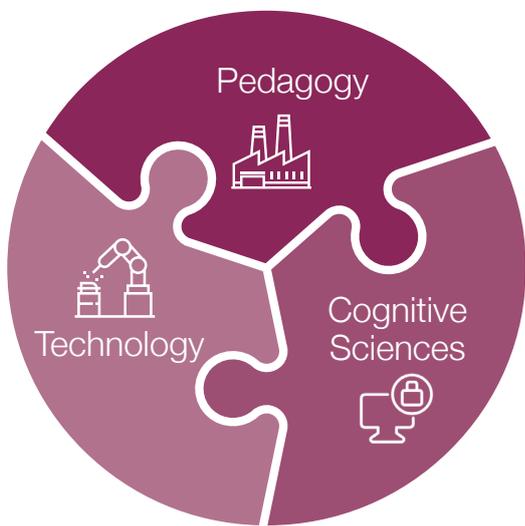
- Branding of Smart Cities and Destinations
- Servicescapes, Biophilics and Green Marketing
- e-Governance, Regulation and Business Ethics
- Information Technology & Migration Pattern
- IOT, Technology Adoption and Entrepreneurship

Pedagogy & Learning Technologies

This thematic area brings together the disciplines of Cognitive Psychology, Neuroscience, Technology. Amrita has a leadership position in Digital Education, building pedagogically sound and award-winning technologies enhanced learning solutions in Skill Development using haptics and HCI, School Education with Adaptive Learning, Simulation and Game based learning with OLABs, Virtual Labs, MedSIM, Distant Learning technologies, Immersive Learning environments. Our

research will be at the intersection of Pedagogy, Neuroscience, Clinical Psychology and Engineering, with Assistive and Personalised technologies for different learning disabilities such as dyslexia, hearing impaired and autism. Additionally, strong contributions are projected in the area of Digital Governance and Data Science & Analytics. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

15 year Research Plan

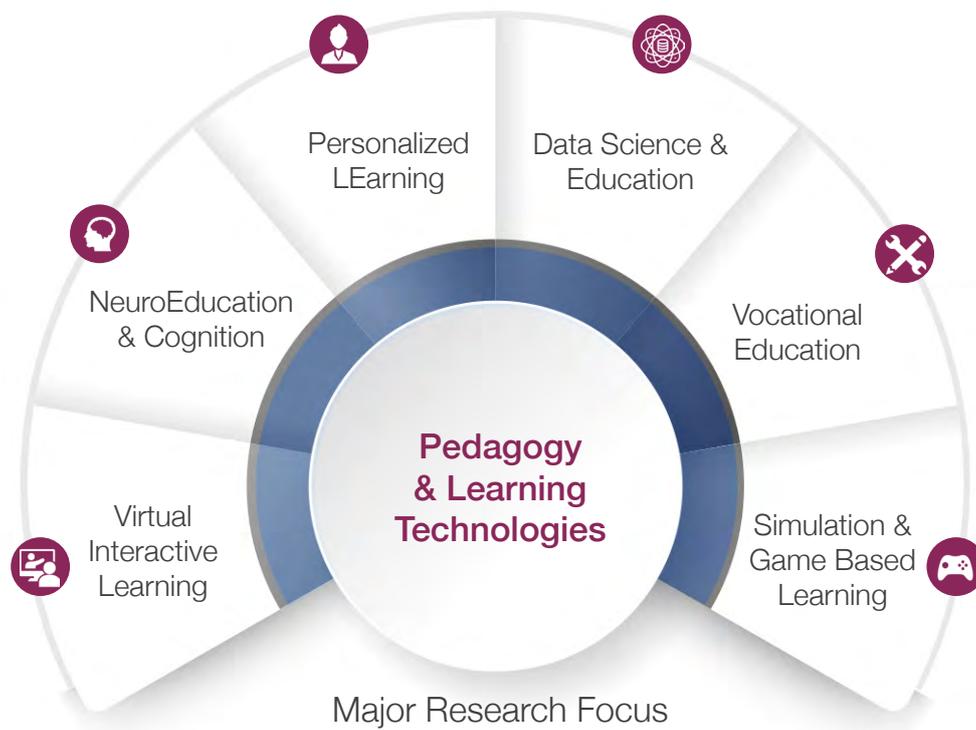


Major disciplines of the thematic area

- Assistive technologies in language learning for the hearing impaired
 - Assessment based on Cards: Image Recognition
 - NeuroEducation & Linguistics for Dyslexia
 - Vulnerability Mapping (UNESCO Chair)

First Five Years

- IoT enhanced & Virtual Science Labs
- Haptics Solutions for Skill Development
- Learning Analytics & and Business Intelligence
- Serious Games and Synchronous Multimedia Animations



- Holographic teaching for vocational trades
- Image Recognition for E-Learning
- Robots as Coaches/Mentors
- Natural User Interfaces

Six to Ten Years

Eleven to Fifteen Years

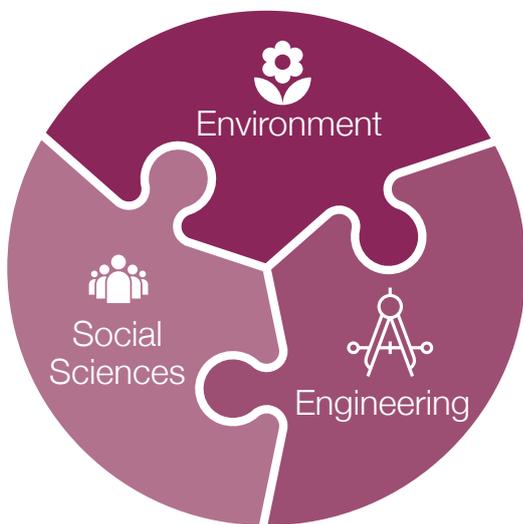
- Robots as Teaching Assistants
- Application to Organ Regeneration
- Affordable Bio medical equipment design
- Assistive Technologies for Learning Challenged
- Medical Simulations enhanced with Holography

Sustainability & Resilient Communities

This thematic area brings together the disciplines of Environment, Engineering, and Social Sciences. Sustainability touches the very survival of life on our planet. The United Nations has systematised the challenges under the seventeen SDGs. Recognising Mata Amritanandamayi Math's (our parent organisation) wholehearted efforts and proven track record towards protecting life and the environment, the UN Academic Impact invited Amrita Vishwa

Vidyapeetham to propose solutions towards achieving the SDGs. In response, we have selected nine of the SDGs spanning Health, Education, Gender Equality, Clean Water & Sanitation, Affordable & Clean Energy, Sustainable Cities & Communities to focus our research efforts. The rewards are expected to be of lasting value to the society. The specific research focus areas are listed in the 15 year plan figure below, with 3 five-year groups.

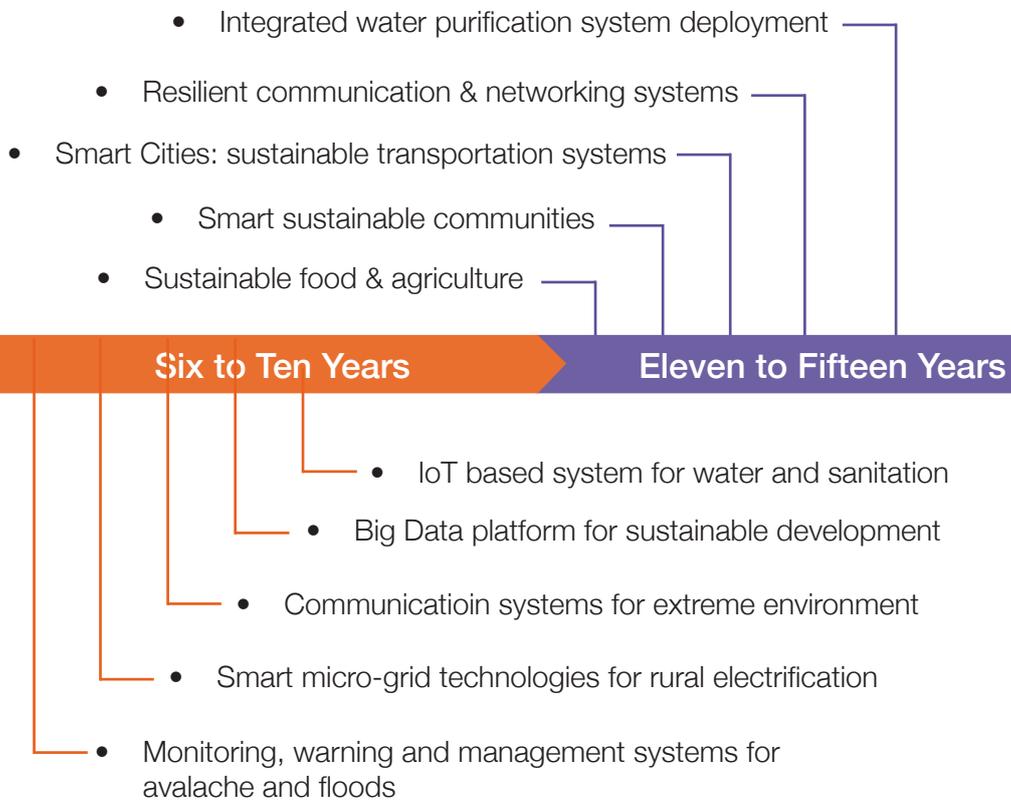
15 year Research Plan



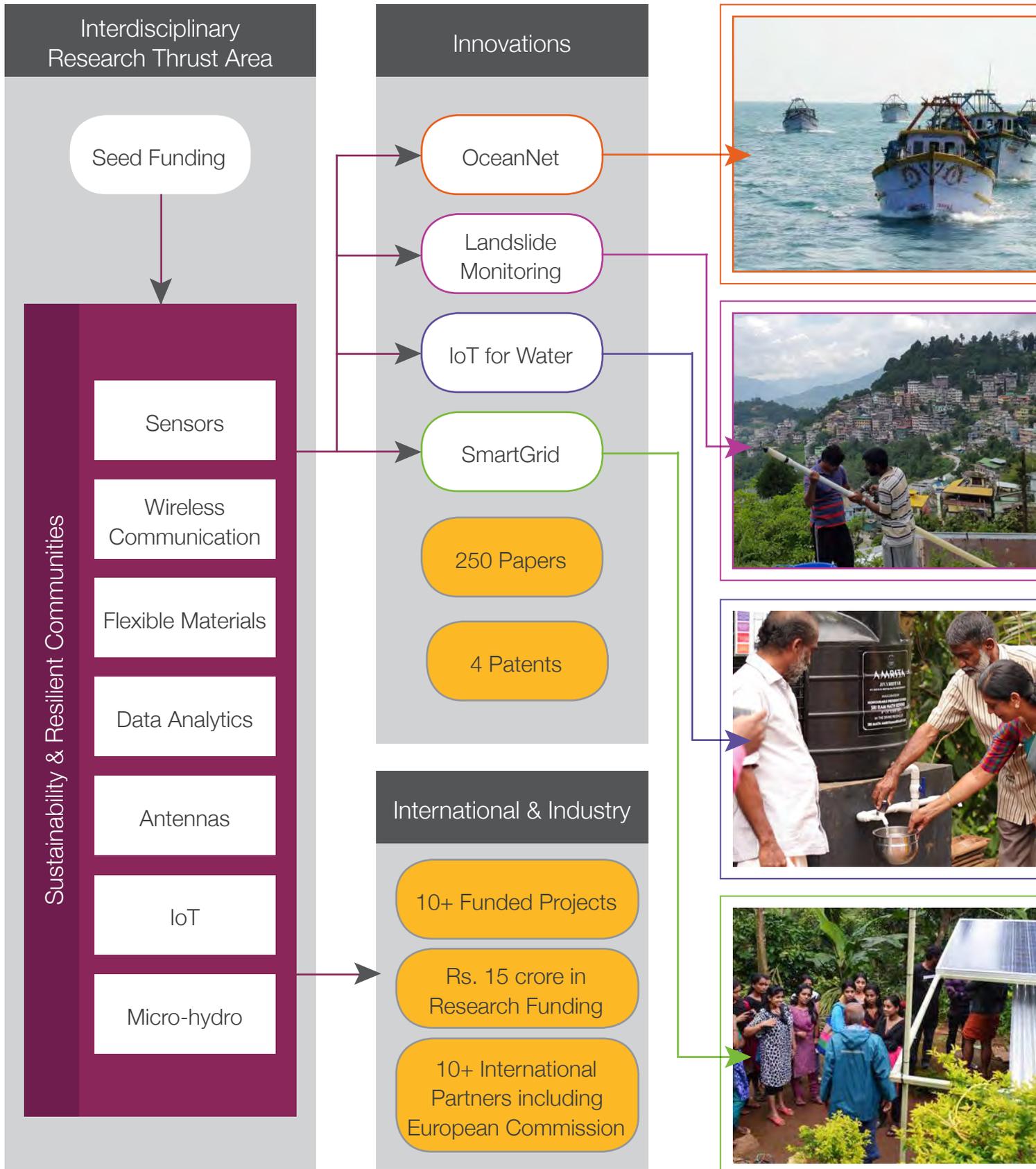
Major disciplines of the thematic area

- Solar energy conversions & storage technologies
- Climate change & disaster management
- IoT Systems, Security & Big Data
- Smart Microgrids
- Women & child development
- Agricultural Monitoring Systems
- Water purification, conservation & sanitation
- Monitoring, warning and management systems for landslides

First Five Years



The diagram depicts how we have evolved thrust areas to develop innovations collaborating with the Industrial & International partners. Furthermore, it shows how we have developed innovations into successful deployments that has helped communities across India.

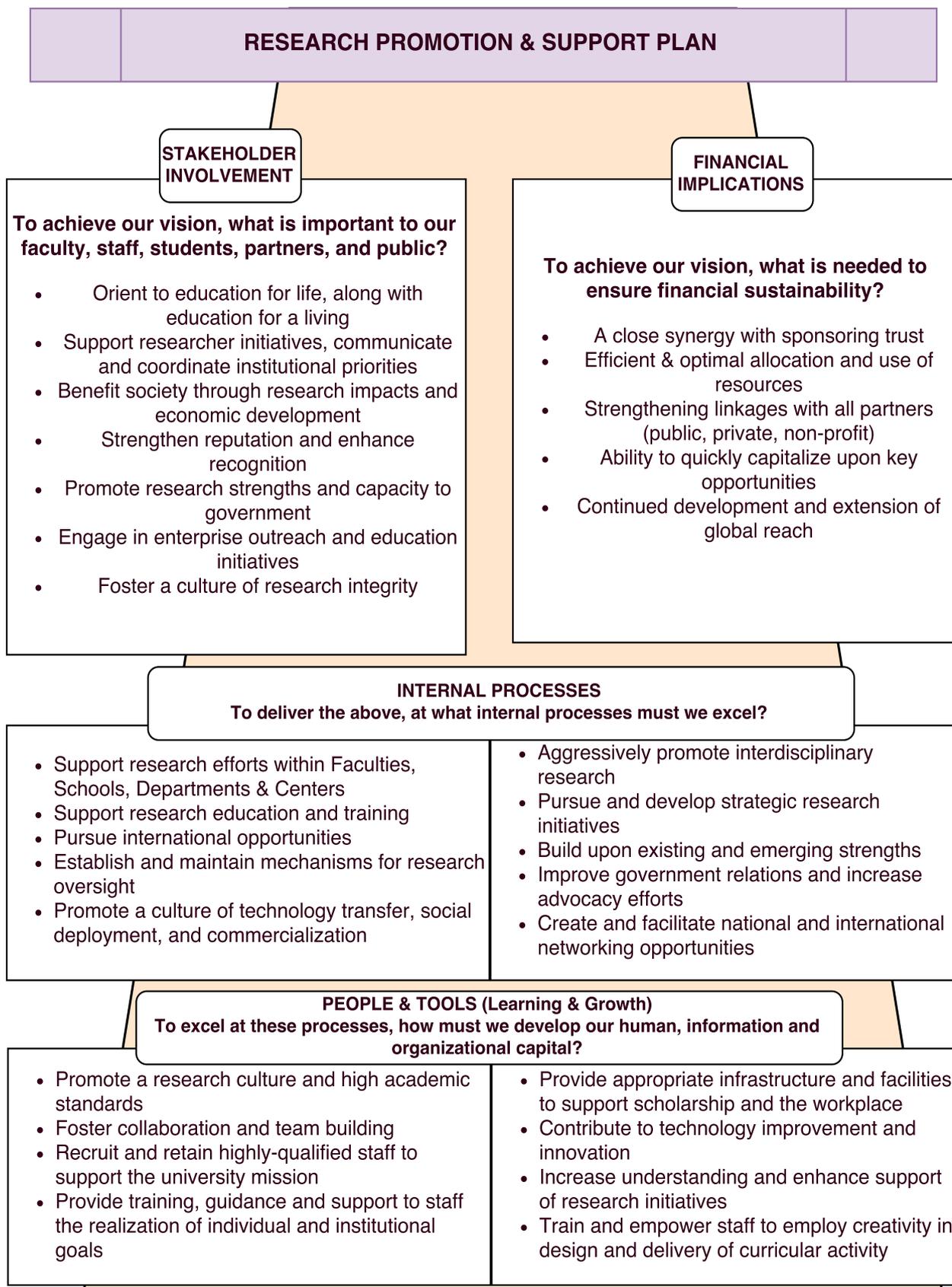


	Deployment	India Impact
	10 fishing vessels deployed with LaRa WiFi OceanNet systems.	Extended range of internet and communication up to 120km into the sea.
	India's 1st landslide monitoring and warning system deployed in Munnar, Kerala since 2010.	Decade long system in place, which has generated 3 warnings and helped more than 5,000 people in areas of danger.
	Smart water purification and distribution system for villages.	Deployed water purification & distribution systems covering more than 10,000 people in rural India across 50 villages.
	Micro-hydro and renewable smart grid deployments in Wayanad and Idukki	Electrified 5 villages using renewable micro-hydro and hybrid sources, including Valaramkunnu near Mothakkara in the Wayanad district Kerala.

15 Year Strategic Plan

- 
- 11 - 15 Years**
 - Sustainable food & agriculture
 - Resilient communication & networking systems
 - Smart sustainable communities
 - Integrated water purification system deployment
 - Smart Cities: sustainable transportation systems
 - 6 - 10 Years**
 - Monitoring, warning and management systems for avalanche, floods, and landslides
 - Communication systems for extreme environment
 - Smart micro-grid technologies for rural electrification
 - IoT based system for water and sanitation
 - Big Data platform for sustainable development
 - 1 - 5 Years**
 - Agricultural Monitoring Systems
 - Smart Microgrids
 - IoT Systems, Security & Big Data
 - Water purification, conservation & sanitation
 - Solar energy conversions & storage technologies
 - Women & child development
 - Skill development and education technologies
 - Climate change & disaster management

The overall strategic framework describing the evolution of the university’s plans in alignment with its vision and mission is given below.



The strategic approach outlined in this section, covering academic and research aspects of the goals & objectives, has already been employed effectively in evolving interdisciplinary courses and programs. A few examples of the successful application of the above approach in Amrita are given below.

Center for Wireless Networks & Applications:

The center started out as a seed project at Amrita, got initial project funding from European commission in 2006 and performed interdisciplinary research for 3 years in wireless networks, sensors, geology, and computer science (depicted in the diagram). This resulted in innovations such as the early warning system for landslides, OceanNet, etc.. In terms of the scholarly output, about 250 papers have been published in reputed conferences and journals, and 4 successful patents. Simultaneously, field deployment of the landslide detection and warning system consisting of 150 sensors was carried out in Munnar, Idukki in western ghats. This system has shown its impact on the society by issuing advanced warnings during many of the monsoon seasons over the last 10 years. With the success of early warning system in landslides, the project got more funding and was replicated in Himalayan regions. To enable students to benefit from these latest advances, M.Tech and PhD academic programs were initiated. The graduates of this program are highly sought after by industry as well as national labs. In 2017, the International Consortium of Landslides awarded the World Center of Excellence in Landslide Disaster Reduction. The proposed 15 year research plan for the future further extends the frontiers of the sensor technology in climate change & disaster management, smart energy, water &

sanitation, and many other areas that are now recognized as highly impactful by top ranked universities around the world.

School of Biotechnology: The department started with seed Amrita funding and lead to a funded TIFAC project in 2007. The researchers collaborated with the schools of medicine and engineering and developed a low-cost automated insulin pump. B.Sc, M.Sc, Ph.D programs were introduced. In 2014, the technology transfer was done with an industrial partner Wipro. International patents and deployment with the Gates Foundation.

Amrita's Centre for Nanosciences: Started as a project under the Nano mission in 2006 and now has blossomed into a world-renowned centre of excellence. The Centre has developed unique products such as the brain wafer, Nanomedicine for drug resistant leukaemia, contrast enabled bone implant for large size defects, nano-textile implant for pancreatic cancer, nano-enabled hyperthermia for liver tumors, a nano vaccine for multiple sclerosis and a low cost Raman-based screening tool for oral cancer. Started M.Tech program in which 50% of the students are from engineering and the remaining 50% are from medicine. Also, Ph.D. and post-doctoral research programs have been initiated.

With a rich foundation of expertise and experience, the strategic academic and research plans have been developed to set the university firmly on the road to excellence. The courses and programs are designed in alignment with this plan, in well-defined interdisciplinary areas. We present the academic plan showing the courses proposed followed by the research plan.

Part 1. IV. b

A faculty recruitment policy and plan to meet the academic plan requirements and to achieve 1:10 faculty-students ratio.

Amrita has been very successful in attracting a large number of faculty from premier institutes in India as well as abroad. The recruitment policy is formulated to attract young and talented faculty from all over the world. The policy has been designed to offer incentives to make Amrita a destination for quality faculty, including an accelerated career growth trajectory, and an excellent opportunity for highly capable and productive

individuals. Amrita will be an equal opportunity employer. Joint appointments in multiple disciplines (research faculty involved in multiple disciplines) as well as interdisciplinary faculty (Assistant Prof., Associate Prof., Professor) appointments will provide greater impetus to facilitate research progress. The new policy will also include an internationally accepted/recognized best practice for a tenure track system.

Policies are tailored to the following broad categories



Engineering & Sciences



Medicine

Assistant Professor of Practice 1
(predominantly teaching responsibility)

Ph.D. / MD / MS in relevant area

Assistant Professor of Practice 2
(predominantly teaching responsibility)

Ph.D. / MD / MS in relevant area and a minimum of 5-8 years of teaching experience

Assistant Professor of Practice 3

Ph.D. Ph.D. / MD / MS in relevant area and a minimum of 9-12 years of teaching experience



Humanities & Social Sciences



Management

Example policy for recruitment

Assistant Professor level 1

Ph.D. / MD / MS in relevant area from top 1000 ranked university

Assistant Professor Level 2

Ph.D. / MD / MS in relevant area from top 500 ranked university

Assistant Professor Level 3

Ph.D. in relevant area from top 100 ranked university

Suitable post-doctoral and/or industry R&D experience will be factored in for all Assistant Professor positions.

Associate Professor

Ph.D. / MD / MS in relevant area from top ranked university and equivalent accomplishment to a tenured Associate Professor at the university; strong record of publications in reputed journals and securing extramural funding; demonstrated experience of guiding research scholars

Additional Professor (Health Sciences)

Ph.D. / MD / MS in relevant area from top ranked university and equivalent accomplishment to a tenured Associate Professor at the university

Professor

University Professor – exceptional faculty outstanding in both teaching and research with salary funded by university

Endowed Professor - exceptional faculty outstanding in both teaching and research with salary funded by endowment funds

Emeritus Professor - excellent faculty outstanding in both teaching and research who have retired from service

Adjunct Professor – non salaried faculty contributing in teaching and research part-time

Faculty recruitment incentives

Start-up package which includes seed grant, full time research assistant for an initial period of at least one year, laboratory research space and travel grant

Faculty can draw an additional 30% of their annual salary from research grants (if permitted by the granting agency)

Promotion Policy

University will be implementing a tenure track program to ensure continuity of high performance of faculty in both teaching and research.

Faculty hired as Assistant Professor Level 1 on a tenured track, must undergo mid tenure evaluation at 3 years and tenure evaluation at 6 years.

Faculty in Level 2 must undergo mid tenure evaluation at 2 year and tenure evaluation at 4 years.

Faculty in Level 3 must undergo tenure evaluation at 3 years.

Granting of tenure is based on national & international review, and excellence in research and either teaching or service.

Upon grant of tenure, Assistant Professor will be promoted to Associate Professor.

A tenured professor will undergo post-tenure review every 3 years and is required to show continued excellence in research and teaching/ service.

Promotion to full Professor will be based on faculty having made substantial impact in his/ her field internationally.

The university will establish personnel committees for recruitment of faculty and tenure evaluation committees for all promotion/decision.

At our current combined (full time and adjunct) faculty strength of 1700, we are already at 1:12, a faculty student ratio close to the target of 1:10. We will pursue the faculty recruitment policies outlined below, to meet the academic plan:

1. Faculty Recruitment of

- a. 750 in 1-5 years
- b. 500 in 6-10 years
- c. 500 in 11-15 years

2. Recruitment of Faculty with expertise and skills that are focused and/or aligned with the thrust areas for research over the 5/10/15 year time frame as mentioned in Sections IV a & V a

Part 1. IV. c

Proposal, if any, to recruit faculty from industry, Government, Non Profit organization etc.. Including foreign faculty.

The recruitment of new faculty will be based on continuous maintainance of high standards of academic excellence. Toward this end, 30% of faculty will be recruited based on them having substantial international academic experience.

- The recruitment will involve evaluation of Key Performance Indicators for faculty retention including publications, patents, revenue generation, extramural funding, product development and service to community.
- Recipients of special honours and awards of national & international recognition would be considered for fast track selection

- Over the next few years the following guidelines will determine the recruitment of our faculty:
- Continue current practice of hiring PhD candidates from Industry, Government, Nonprofit and Foreign institutions,
- Continue current practice of proactive hiring,
 - Continue with current practice of standardized interview process,
 - Continue current annual practise of engaging international faculty from over the world,
- Identify potential industrial collaborators globally,
- Provide housing to suit a modern family's needs including good schools, modern lifestyle and cultural environment (important for faculty retention),
- Provide relocation package and assistance for international move,



- Balance the recruitment to include expertise from all groups including industry, government, non-profit, and international,
- Leverage the numerous existing international industrial partners and hire Subject Matter Experts as faculty or consultants to teach specialized courses,
- Leverage the numerous existing international collaborations to reach out to the prospective candidates well on their way of pursuing Ph.D. in those respective universities, and
- Invite potential candidates for seminars and workshops at Amrita, which allows them to directly experience the highly attractive work ambience at Amrita.

- In addition to our general proactive hiring, Amrita will fine tune the recruitment approach for identifying and hiring talented professionals who can accelerate research in the existing thrust area groups. This includes:
 - Continuous review and enhancement of policy for retaining world class talent, and
 - Attracting the alumni into the academic ecosystem.

Some of Our Prominent Adjunct Faculty Members

- Dr. Leland Hartwell, Professor Nobel Laureate, Fred Hutchinson Cancer Research Center, Asu
- Dr. Maarten Van Steen, Professor, Vu, Amsterdam
- Dr. Kenneth Salisbury, Professor, Department Of Computer Science And Surgery, Stanford University, Usa
- Dr. Gillian Murphy, Deputy Head Of Department Professor Of Cancer Cell Biology, “Cruk Cri- Cancer Research Uk Cambridge Institute University Of Cambridge, United Kingdom
- Dr. Thomas Haenselmann, Professor, University Of Mannheim, Germany
- Dr. Masahiro Fujita, Professor, The University Of Tokyo, Japan
- Dr. Darell E Long, Professor, Baskin School Of Engineering, Santa Cruz
- Dr. Chun-Gon Kim, Professor, Professor Of Aerospace Kaist South Korea”
- Dr. Hideaki Nagase, Professor, “Head Of Matrix Biology Kennedy Institute Of Rheumatology University Of Oxford United Kingdom”
- Dr. Jaap Heringa, Professor Of Bioinformatics, Director, Centre For Integrative Bioinformatics, Department Of Computer Science, Vrije University, Netherlands
- Dr. Vural Ozdemir, Associate Professor Human Genetics The Council Of Higher Education, Turkey
- Dr. Herbert Bos, Associate, Professor, Versity Amsterdam, Netherlands
- Prof. Dr. P.H.L Notten - Tu Eindhoven, Chair, Energy Materials And Devices, Eindhoven University Of Technology
- Mr. Chad Kymal, Chief Technical Officer And Founder” Omnex Ann Arbor, Mi Usa”
- Ms. Karen Moawad, Ceo & Founder, Hummingbird Associates, Washington, Usa”
- Dr. Henry Muccini, Assistant Professor, Department Of Information Engineering, Computer Science And Mathematics ,University Of L’aquila ,Italy
- Dr. François Gauthier, Associate Professor, Religious Studies, Field Societies, Cultures And Religions, Social Sciences Department, Faculty Of Arts ,University Of Fribourg, Switzerland
- Dr. Natalia Maltsev, Professor, Department Of Human Genetics, University Of Chicago ,Usa”
- Dr. Sidney Strauss, Professor, School Of Education ,Tel Aviv University, Tel Aviv ,Israel
- Dr. Eric Blanco, Deputy Director, School Of Industrial Engineering And Management Grenoble Inp ,France
- Dr. Larry Sanders, Professor, University At Buffalo, New York

Part 1. IV. d

Student admissions policy mentioning plan to select Indian and foreign students

Amrita has a merit based admission policy in the programs offered by all its schools. In medical disciplines like MBBS, BDS and Ayurveda, Amrita admits students based on government mandated single common entrance exam and approved by MCI/DCI/CCIM. Admission to undergraduate B.Tech. programs is through a

national level Amrita Engineering Entrance Examination (AEEE). Admissions to MBA program is through CAT / MAT score. Admission to all other programs at undergraduate, graduate and doctoral levels uses a merit based rank list prepared at the school level based on entrance tests and interviews.

Admission Plan: 1 – 15 Years

Enhanced admission policy for admitting domestic and international students:

Sl. No.	Program	Domestic students	International students
Graduate Programs			
1	B.Tech.	Amrita Engineering Entrance Examination	SAT / TOEFL / IELTS
2	B.Sc. / BCA / BBM / B.Com. / Int. MA / Int. M.Sc. + all UG programs under all Schools	Entrance Examination & Interview	ACT with Writing and SAT Subject Tests, or SAT and SAT Subject Tests / TOEFL / IELTS
3	MBBS / BAMS / BDS	NEET	NEET
Post Graduate & Ph.D. Programs			
1	M.Tech	GATE / Rank list of applicants based on qualifying marks	GRE / TOEFL / IELTS
2	MCA / MSW / M.Sc. / MA + all PG programs under all Schools	Entrance Examination & Interview	GRE / TOEFL / IELTS
3	MD / MS /DNB	NEET	NEET
4	MBA	CAT / MAT / GMAT	GMAT / TOEFL / IELTS
5	Ph.D.	Entrance Examination & Interview	GRE / GMAT / TOEFL / IELTS

International Admissions:

An international applicant is a student who is not a citizen of the Republic of India and needs a Student Visa.

Applicants will need to submit:

- Tentative Plan of Study
- IELTS / PTE (if your native language is not English)
- Statement of Purpose
- Recommendation (2)
- Resume or Curriculum Vitae
- Official high school transcript
- Official university transcript (applicable for Masters Admissions)
- 3.00 grade point average (GPA) (a “B” or better where “A” = 4.00 CGPA) from a secondary school.
- Minimum SAT / GRE / GMAT Scores
- All approved high school diplomas from international boards, for example, “A” level from UK, American High School Diploma, and Australian High School Diploma will be accepted.

English Language Proficiency Requirement

Success at Amrita begins with a strong comprehension of the English language. Because our rigorous courses are taught in English and move at a fast pace, fluency in the

language is essential for understanding concepts and expressing effectively.

Applicants whose native language is not English must provide evidence of English language proficiency by submitting test scores from **one of the following:**

- Test of English as a Foreign Language (TOEFL)
- International English Language Testing System (IELTS)
- Pearson Test of English (PTE)

Special Admission for Exceptionally Gifted Students:

Exceptionally gifted students who demonstrate brilliant accomplishments but who may not have completed formal schooling requirements will be given special admission privileges irrespective of their age, however young they may be. Some such students who have demonstrated that they have already completed undergraduate level material in the high school itself may even be offered direct admission to PG level courses.

A review of the admissions for the last few admission cycles will be conducted and process will be enhanced and or modified for greater foreign student inclusion.

As part of the internationalization and diversification strategy, a quota system will be developed for each continent every 5 years and also for proactive recruitment strategies targeting deficient continents.

Part 1. IV. e

Plan to provide scholarship to meritorious Indian and foreign students.

At present Amrita provides tiered levels of meritorious scholarships to top ranked students in the Amrita Engineering Entrance Examination (AEEE) conducted by the University. Students from low

income background joining any program are provided merit-cum-means scholarship. In addition, students who top CBSE / state board exams are extended scholarships in select programs.

Scholarship Program:

Scholarship for Bachelors program	
Top AEEE Ranks Range (in %)	Percent Scholarship
Students in the rank range 96 – 100	90 %
Students in the rank range 91 – 95	75 %
Students in the rank range 81 – 90	50 %
Scholarship for PG & Ph.D. programs	
Numbers per year	430
Scholarship Amount (in Rs.)	Upto 25,000 per month

Amrita will initiate the following aid types to meritorious and deserving students. Amrita will also set up a financial advisor desk that will advise and help students access various financial assistantships.

Types of Need-Based Aid

Year 1 - 5

A variety of scholarships opportunities will be available for need-based Amrita students.

- Amrita's Chancellor's Scholarship as a unique scheme to reward:
 - Exceptional need-based students from India pursuing programs under joint

collaboration between Amrita and top 500 ranked international universities

- International need-based students aspiring to join Amrita for PhD and research intensive programs
- Amrita's Chancellor's Scholarship as a

unique scheme to reward:

- Help secure extra mural scholarships such as
 - Visvesvaraya awards at the National level,
 - Erasmus Mundus at the International level.

Grants

Grants are gift assistance awarded to qualified need-based undergraduate students demonstrating exceptional financial need (i.e., grants are need-based aid). Grants do not have to be repaid as long as enrollment for the semester in which you receive the grant is maintained. Grants are disbursed each semester based on students enrollment status and will be prorated if one is not enrolled full-time. Students may be asked to return a portion or the full grant if they do not maintain their enrollment status for the entire semester along with 8.0 above SGPA.

Loans

If grants, scholarships do not cover the costs of attending college, students might consider loans. Though loan money must be repaid, interest is typically lower than consumer rates. Amrita will work with bank to setup up Loan Fastrack desk in the campus and potentially work out special interest rates with select bank. Students can approach them to see if loans are right for them by learning more about different types of loans and how to apply for them.

Amrita's 100% placement record will help students secure a job before graduating and enables them to begin repaying their loan.

Year 6 - 10

A variety of scholarships opportunities will be available for need-based Amrita students.

Student Jobs

Students may need to work in order to meet educational and living expenses or you feel the experience could be a valuable part of your education. The skills they obtain from working complement their academic performance and communicate to future employers their ability to succeed in a professional setting. Amrita will allow students to work for limited hours per week in on-campus opportunities.

Some the the potential positions may be;

- Administrative Assistant
- IT Assistant
- Library Assistant
- Research Assistant (RA)
- Residential Advisor
- Teaching Assistant (TA)

Years 11 - 15

Establish Special Programs

The Special Programs will be offered as our commitment to low-income families – making higher education affordable and accessible, the program will provide tuition and fees for up to four years to qualifying high school students.

The Special Program will provide tuition and fees to substantial number of qualifying students as long as students continue to meet eligibility criteria and maintain at least a 6.0 cumulative grade point average.

Part 1. IV. f

A comprehensive plan to develop research laboratories with demonstrable progress towards it.

We have currently approximately 3 lakh sq. ft. of research labs at Amrita, and the plan is to increase completed research laboratory space by an additional 4 lakh sq. ft. The physical infrastructure should be completed within 5 years and be fully functional within 10 years. A major new step forward will be the setting up of a Manufacturing Research Centre (MRC) comprising of about 1 lakh sq. ft. of research space with state of

the art laboratories exploring all aspects of industrial manufacturing as well as nano and micro scale manufacturing with the intent of satisfying the Make in India Program of the Government of India and to provide affordable products for India. These labs are not undergraduate or teaching labs, but research labs intended to support faculty research, grant writing, and execution of extramural research grants.

Year 1 to 5

- Assistive technologies
- Auto immune research lab
- FISH Lab (Fluorescent In-Situ Hybridization)
- Histopathology lab
- Tissue engineering lab
- Wound healing lab
- Molecular Simulation and drug discovery
- Computational neuroscience lab
- High Performance Computing
- Image analysis and recognition
- IoT Labs
- Nanocomposites Lab
- Photonics lab
- Metal casting
- Microscopy labs
- Microwave processing
- Robotics and training
- MRC
- Remote sensing and wireless monitoring
- Skills development

Year 6 to 10

- Application and Functional Testing
- FACS Lab (Flow Cytometry)
- Automation and process control
- Ayurveda research Labs
- Battery testing labs
- Big Data Analytics Labs
- E Learning research
- Emissions Lab
- PV characterization & Solar cell fabrication
- Surface texturing Lab
- Shock wave and Hypersonic lab
- Powertrain technology
- Smart Microgrid research lab
- Wind energy labs
- Cancer Biology Lab
- RNAi Lab

Manufacturing for Affordable Healthcare:

Amrita has identified indigenous manufacturing of healthcare equipment as a major need for our country. Class I and Class II equipment which require less regulatory control includes equipment that fall into the following four classes: consumables and implants; instruments and appliances; diagnostic imaging and patient aids including prosthetics and orthotics and pacemakers. As an example, Amrita Institute of Medical Sciences, alone spends about Rs. 10 crores a year to import a variety of class I and II medical equipment. We wish to emphasize indigenous manufacturing research that will lower the cost for patients, particularly since imported equipment are

highly overpriced. Even if India invests for manufacturing research in only one percent of total market size of about Rs. 100,000 crores, namely, Rs. 1000 crores a year, to develop many of these equipment indigenously, India could be self-sustainable in the small medical equipment sector and could even compete in the international market by exporting affordable class I and II equipment. Given Amrita's strength in electronics, mechanical engineering, biotechnology, nanotechnology, sensors, materials, computer science and engineering, Amrita is well poised to expand a thrust in manufacturing with a special focus on healthcare (small medical equipment & devices).

A second major area of manufacturing for the healthcare sector is new drugs, particularly drugs with less side effects and drugs that have improved efficacy by controlling their delivery and targeting. Amrita School of Biotechnology is developing new medicines from natural products and the Amrita School of Ayurveda is developing new medicines from ayurvedic herbs. The Indian nanomedicine market potential is huge - an annual Rs. 50,000 crore, almost all of which is sought to be grabbed by foreign companies such as Abbott, Johnson and Johnson, Pfizer, etc..

The market potential for natural medicinal products is about Rs. 20,000 crore, and India is only producing 10% of its market potential with foreign investors eyeing this potential in the coming years. Again, it is expected that these companies will provide such products at extraordinarily high cost to patients. Thus, there is a huge need to develop strong manufacturing capability in advanced but low cost new drugs to meet this demand.

Year 11 to 15

- Scale up and Societal Translation
- Microelectronic Fabrication
- Microfluidics Lab
- Alternative Technologies for Health Labs
- Antibody Lab
- Biorepository
- Analytical Chem and Venomics
- Toxicology Lab
- Protein purification lab
- Protein coating lab
- Organ printing lab
- Drones and UAV Labs
- Genomics Lab
- Neurophysiology lab
- Cell expression facility

Specific Laboratories Planned:

- Manufacturing research centre (MRC) and associated labs. These labs were described in the previous section.
- Dry and wet labs for faculty research. In addition to the MRC the university plans to set up additional research labs. These will include specialised labs as well as wet and dry labs for faculty and research students to conduct research. The wet and dry labs will provide bench space and will be equipped with small equipments for routing research and sample testing, handling, and characterization. Additional wet and dry lab bench space for students is expected to be around 3 lakh sq. ft. for the entire university. The additional specialized labs are listed below:

Labs in Medical and Biology Areas:

An important feature of the plans include comprehensive facilities for preclinical testing. A new facility is planned for Good Laboratory Practice (GLP) animal labs for small animal testing. Preclinical testing facility will also include comprehensive animal imaging capability using animal MRI, Micro CT and multispectral imaging; animal cath labs, animal robotic surgery research labs and histopathology labs. Other medical/biology research labs include:

- i. Microbiology lab with BSL2 and BSL2b levels for pathogenic bacteria
- ii. Molecular Biology lab
- iii. Genomic lab with sequencing capability
- iv. Bioinformatics lab
- v. Polyclonal antibody lab
- vi. Protein purification lab
- vii. Protein coating lab
- viii. Histopathology research lab
- ix. Organ printing lab
- x. Fluorescence In Situ Hybridization (FISH) lab for genomic characterization

- x. of mutations
- x. Additional comprehensive cell culture labs under clean room conditions
- xi. Biorepository labs for storing of biological samples for analysis
- xii. Bacterial or insect cell expression facility
- xiii. Microscopy lab for biology including fluorescence and confocal
- xiv. Fluorescence Assisted Cell Sorter (FACS) lab
- xv. Biochemistry research lab
- xvi. Pulse diagnosis and alternative technologies diagnostic lab
- xvii. Auto-immune research lab

Other labs planned to be expanded are:

- i. Cancer Biology lab
- ii. Cell-line Engineering lab
- iii. Wound Healing lab
- iv. Computational Neuroscience lab
- v. Neurophysiology lab
- vi. Phytochemistry lab
- vii. Proteomics lab
- viii. RNAi lab
- ix. Analytical Chemistry and Venomics lab
- x. Tissue engineering lab
- xi. Drug delivery systems lab
- xii. HPLC characterization lab
- xiii. Biobanking of specimens
- xiv. Quantitative analytical toxicology lab
- xv. Computational pathology lab
- xvi. Molecular pathology lab
- xvii. Ayurveda research lab

Timelines

The medical GMP manufacturing lab construction has started for drug delivery and implant products. Manufacturing of products not including chemo drugs will become functional in one year.

Approximately 4-6 manufacturing lines are planned. Cancer based Good Manufacturing Practices (GMP) lines will become fully functional in 2 years.

- a. GLP animal lab construction plans

- have been finalised and construction will start in the first year. This will be completed and functional in the first two years.
- b. Construction plans will be developed in detail for additional 4 lakh sq. ft. of research lab space. All construction will begin sometime towards the end of the first year and space will be made available in 5 years.
 - c. Functional research labs will be set up in phases with the first functional labs coming on line in the third year. About 2 lakh sq. ft. will be fully functional by 5 years and the remaining will become fully functional within ten years.

50% of the listed labs are planned to become functional fully in 5 years and the remaining 50% will become fully functional within ten years. All plans for the labs associated with the school of medicine (including nanomedical sciences) [items (i) to (xv) above] have been fully finalized and construction has begun on approximately 1 lakh sq. ft. of the infrastructure. GMP/GLP labs will be made functional in 2 years and the rest within 5 years.

Thin film vacuum deposition labs will be completed in the first two years and made functional. Also in the first two-three years a scalable electrospinning lab for nanotextiles and nanofibrous materials and films will be completed.

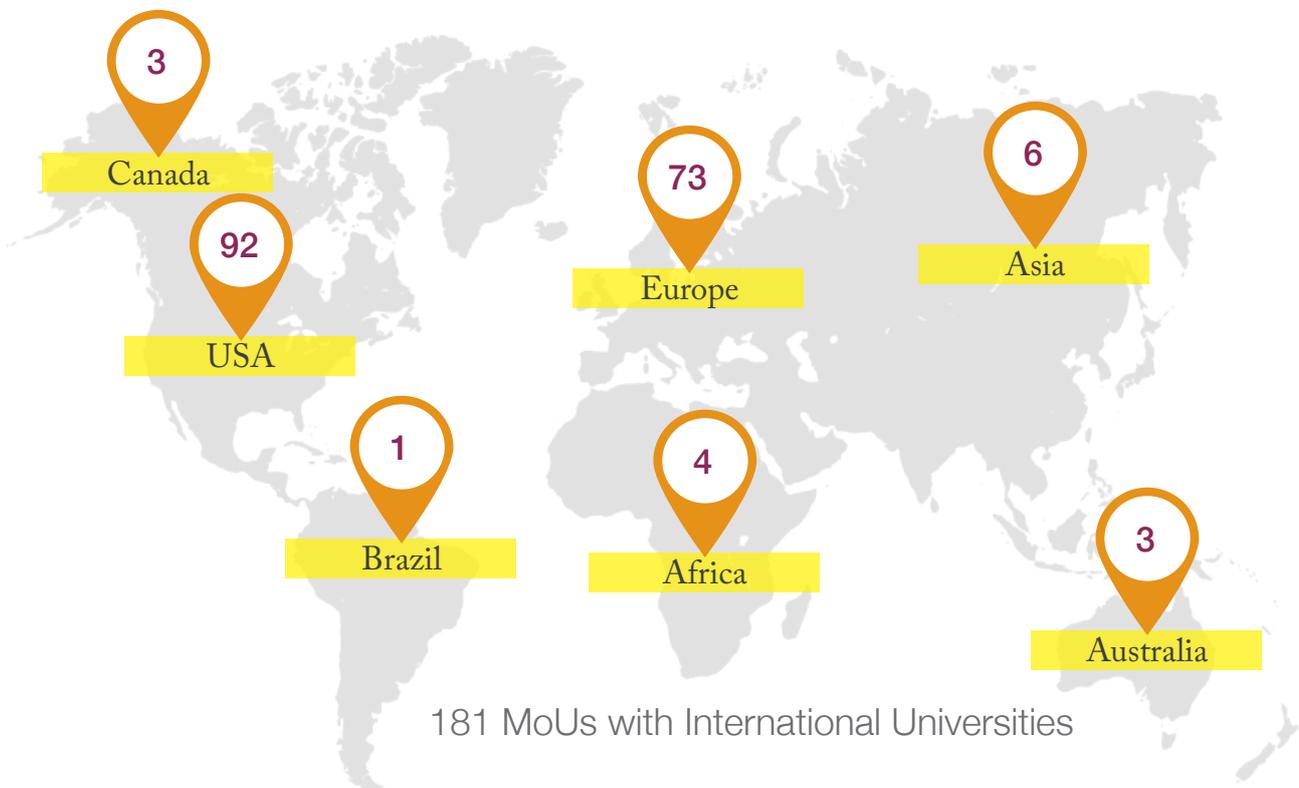
- d. The following are examples of other research labs planned or to be expanded in Computer Science and Engineering Areas:
 - i. Intelligent Controls lab
 - ii. Automation and Process Control lab

- ii. Microwave processing lab
- iii. Metal casting lab
- iv. Photonics lab
- v. Computational lab for Big data Analytics
- vi. Smart Microgrid research lab
- vii. Expanded wireless landslide detection lab
- viii. Wireless sensor networks lab
- ix. Remote sensing and monitoring lab
- x. Embedded systems design lab
- xi. Robotics and robotics training research lab
- x. Skill development research lab
- xi. Assistive Technologies lab
- xii. E Learning Research lab
- xii. Virtual and O Lab development research lab
- xiii. Computer hardware and systems control lab
- xiv. Frugal research lab
- xv. IoT lab (development of IoT architecture)
- xvi. Security for Embedded Networked systems lab
- xvii. Artificial intelligence and robotics lab
- xviii. Embedded control systems lab
- xix. Molecular simulation and drug discovery lab
- xx. High performance computing lab
- xxi. Image analysis and recognition lab
- xxii. Powertrain technology lab
- xxiii. Emissions lab
- xxiv. Surface texturing lab
- xxv. Nanocomposites lab
- xxvi. Shock wave and hypersonic lab
- xxvii. Drone and UAV (Unmanned Aerial Vehicle) lab
- xxix. Humanitarian technology lab
- xxx. Radio Frequency lab
- xxxi. Roll to roll fabrication lab for solar cells
- xxxii. Wind energy lab
- xxxiii. Photovoltaic (PV) and PV Characterization labs
- xxxiv. Battery Testing labs
- xxxv. Microfluidics lab for point of care testing

Part 1. IV. g

Plan for Teaching and Research Collaborations with Global Universities

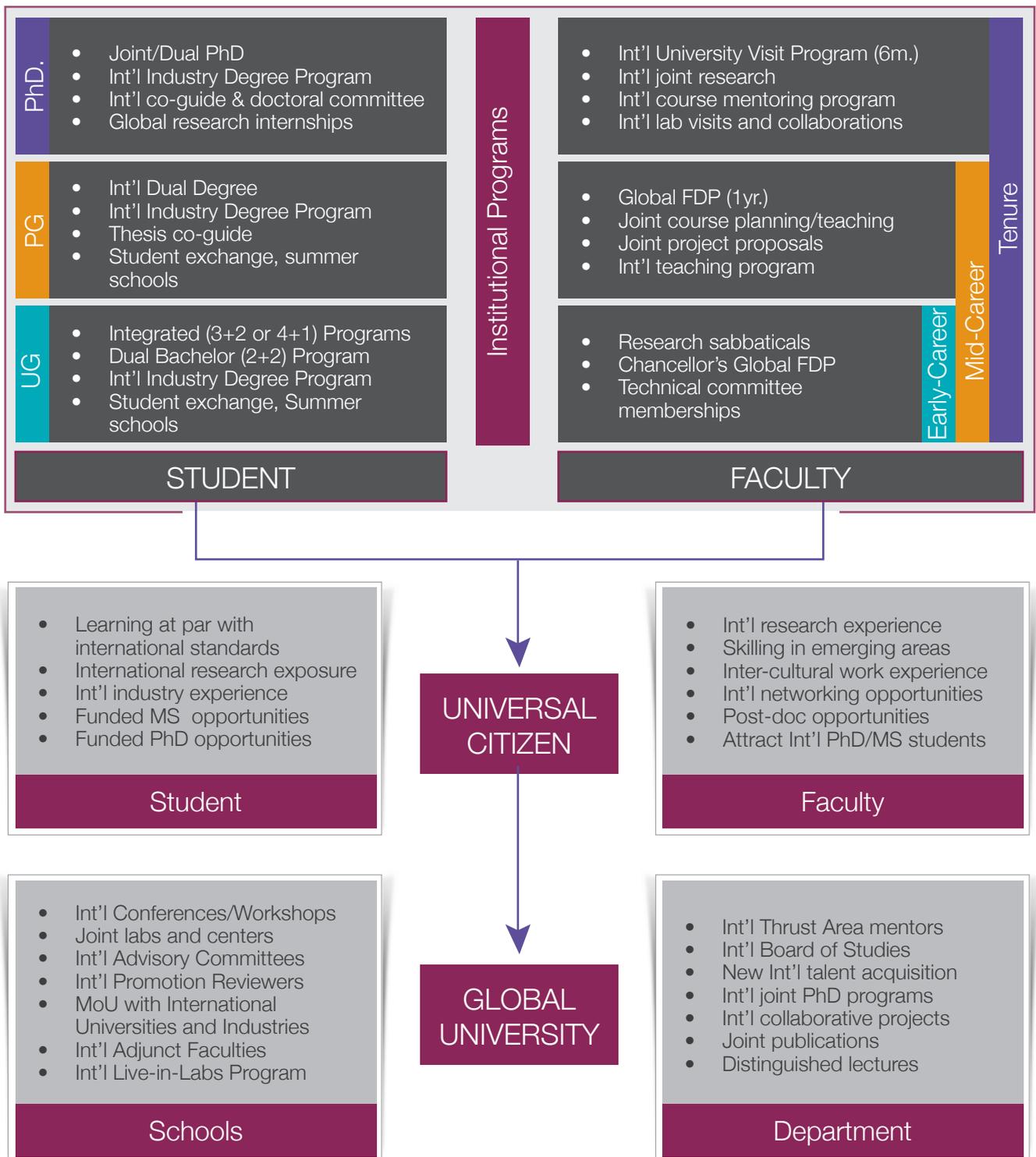
International Plan



Amrita will broaden and deepen its excellent track record of existing international collaborations to enhance the teaching, learning, and research quality, to develop the constituent faculty and students as “Universal Citizens” for building a “Global University”. This objective will be achieved by strengthening the institutional programs,

increasing diversity, enhancing engagement in teaching & learning processes, and developing innovative assessment techniques. Through these we aim to: transform students into universal citizens, elevate faculty performance to international caliber, and position our university as a global university.

A detailed step by step plan has been devised for achieving the above mentioned objectives. The following chart depicts the approaches, programs, processes, and systems adopted to develop Amrita as a globally reputed universities.



Some of the more significant components of our plan are elaborated below:

Years 1 - 5

Expanding the International Network to enhance teaching, learning and research quality

For this purpose Amrita will enhance the capabilities of the International Office to oversee the following planned activities:

- Leveraging the international connections of numerous faculty who have moved to Amrita from the top 500 ranked universities,
- Expanding the number of collaborations with additional top 500 ranked universities.
- Work towards an international level of standardization and comparability in teaching, which will be achieved by introducing integrated programs, dual masters program, joint Ph.D. programs, dual Ph.D. programs, & student exchanges.
- Introduce courses of international quality to be offered by international faculty, courses co-taught by international faculty, summer schools by international faculty, co-guidance of masters and Ph.D. thesis by international faculty, which will instill good/effective learning practice that thereby contributing to development of an active, cooperative and intellectually stimulating student community.

The major programs envisioned for teaching enhancements for developing global citizens can be summarized as:

3+2 & 4+1 Joint Program

This program will provide the opportunity to students to earn a bachelor's degree from Amrita and a master's degree from an international university. This will provide the students with a unique opportunity to receive value based education and complete all the fundamental subjects from Amrita before going abroad to pursue their master's degree from an internationally reputed university. This will help develop a community of students who are at par with the students from any top ranked international

universities. This will also help enhance the teaching quality and processes in Amrita so as to match the high standards of the participating international universities.

2+2 Bachelor's program

Through this program we envision to provide a very unique program for highly meritorious students to complete two years of education at Amrita and then continue the learning for the next 2 years at the partner university. We aim to raise the standards of the students and teachers to match that of

the partner universities through this program. The bachelor's program with the flexible credit system will be modified accordingly to complete the prerequisite courses before the student moves to the partner university. During the course of this program the students are exposed to working with a diverse group of students and researchers at a n eminent foreign university starting from the early stage of their bachelors' program.

Dual Master's Program

This program will provide the opportunity for a Master's student to earn an Amrita degree along with an international degree. The major objective of this program is to provide students a quick insight into the demands of international education and employment along research skills. After completing the foundational courses at Amrita in their first year, the students spend the next year engaging in research activities at the partner university. In this process the students quickly adapt to innovative teaching practices followed in the partner university. The Amrita faculty remains as the co-advisor for the students' master's thesis along with the main advisor from the partner university. This provides an opportunity for Amrita

faculty to engage in research activities of international standards.

Joint and Dual Ph.D. Program

The program is developed to enhance the quality and quantity of research outcome that could be generated by research scholars at Amrita by engaging with world class professors and laboratories through the joint Ph.D. program. In this program, student will receive a joint degree from the two universities, where as in the dual Ph.D., the student will receive two separate Ph.D. degrees from the two universities by extending their Ph.D. work to satisfy the requirements of the partner university as well. This approach helps the student to raise the standards of his/her Ph.D. degree and be at par with the partner university, via adoption of effective learning practices standardized to international level. Additionally, the student will get exposed to working with a diverse group of faculty, research staff, and Ph.D. scholars, which will help them to extend their horizons in their research domain.

Student Engagement

One of major weaknesses in the Indian teaching-learning system is the lack of



student engagement. Enhancement of student engagement is one of the key strategies to develop the student community and raise them to international standards. To achieve this we are introducing opportunities such as student exchanges, Live-in-Labs programs, summer programs, master's thesis at international university, etc., opening the doors for the students to understand the expectations from a student in international universities. These programs will provide them with opportunities to engage with international students, faculty and research centers, thereby broadening their outlook and helping them understand the key gaps that need to be addressed in becoming an international quality student.

Student engagement is further increased by making international faculty deliver their lectures either online or offline through videos, integrated with discussion hours. This will push the students to be alert and attentive in the classroom, make them prepared ahead of time, to train them to perform self study, to learn by cooperation through interactions among a group of students, to learning from his/her peers, and to think & analyze to get involved in the discussions. This will bring more clarity and will make the students active, cooperative and intelligent and raise them to the level of any other international students.

Faculty Development

This will be brought in by engaging Amrita faculty with international faculty in co-teaching master's, co-advising Ph.D. students, developing joint courses, writing joint proposals, working in joint projects, etc.. Along with these, extra effort will be put in to conduct intensive workshops on research writing, teaching pedagogy, emerging teaching methodologies, emerging research areas, etc.. Specific workshops will be developed by a group of highly qualified

international faculty for improving teaching and learning plans & policies, and on developing specific indicators for quality enhancement in teaching & learning. The co-teaching and co-advising opportunity will also support in achieving the above mentioned objectives through cooperative learning and adopting best practices. We also aim to train our faculty in research and writing towards publications in high impact journals, through foreign collaboration.

International Level Course Development & Delivery

This will be achieved by including international faculty in the board of studies, engaging them in development of teaching and learning plans, engaging them in course delivery, and appointing as course mentors & evaluators. Selected Amrita faculty will be sent to international universities for a semester to be with an international faculty and their research groups to learn and imbibe best practices that can be adopted for effective teaching, learning, r& esearch, and for developing effective feedback policies to enhance the student experience and student satisfaction.

International Faculty Recruitment

International faculty will be recruited to accelerate the institutional change towards achieving teaching and research excellence as well as to enhance diversity & equity among the faculty and student members. New policies for faculty and student engagement will be devised to bring in institutional climate change that will favor the growth in teaching and research excellence.

New Programs for International Students

New programs will be developed to suit the preferences of international students.

Interdisciplinary programs featuring experiential learning (e.g. Live-in-Labs program), integrating multiple disciplines (e.g. M.Tech-MBA, M.Sc.-MBA, B.Tech.-MBA, MBBS-MBA), and oriented to unique heritage of India (MA Philosophy, MA Indian Heritage), will be developed.

Faculty Training

Our faculty will be trained in research and writing for high impact journals to encourage foreign collaborations.

Based on our experience over the last 15 years, one of the key requirements contributing to sustainable and impactful research collaboration is for Amrita to have highly skilled and trained researchers. We will make every effort to train them in sophisticated research methods and proper research writing.

We plan to engage our international collaborators to train the faculty and researchers in writing papers for high impact

journals by developing specific workshops targeted for capacity building in research publications. We also plan to engage each faculty with an international faculty on a specific research project to organically develop the necessary research skills. Along with this we will also provide them the opportunity to perform their Ph.D. under international faculty.

Research Scholarship

A specific international research scholarship, “Chancellor’s Scholarship”, has been initiated to provide funding for the faculty and researchers to visit and work with an international faculty for a minimum of three months, with an objective of writing joint publications, joint proposals, etc..



Partnership with top universities and industries to form joint research projects based on our existing strengths and international collaborations

Building on the excellent relationship with some of the top universities in the world over the last fifteen years, through teaching, research, and project based collaborations, we are initiating joint research in the areas listed in the table below.

Research Area	International Partners
Cancer Research	University of Oxford
Traditional Medicine	University of Cambridge
Microbial Drug Resistance	University of San Diego
Diagnostics of Infectious Diseases	University of Washington
Systems Biology	Vrije Universiteit Amsterdam
Smart Infrastructure	University of Missouri, Politecnico di Milano
Smart Water Conservation Systems	University of California, UNESCO IHE Netherlands, Uppsala University, University of Southern California, University of Twente, University of California, Irvine
Smart grid	Technical University of Munich, KTH, Politecnico di Milano, VTT Finland, Colorado State University
Smart Materials for Energy and Water	Penn State, Columbia University, University of Manchester, University of Ireland
Natural Hazards and Disaster Management	Kyoto University, Uppsala University, King's College London
Climate Change Modeling and Early Warning Systems	University of Zurich
Numerical Simulation of Landslides	Politecnico di Milano
Monitoring of Landslides	Italian National Research Council (CNR)
Geophysical Techniques for Landslide Monitoring	British Geological Society (BGS)
Distributed System Security	Vrije Universiteit Amsterdam

Research Area	International Partners
Cybersecurity	Grenoble INP
Mobile & Wireless Security	University of Helsinki, Aalto University
Big Data Analytics	University of Louisiana at Lafayette
Wireless Health Care Systems	University of California San Diego, ETH Zurich
Sustainable Communities	EPFL, University of Trento, Stanford University
Advanced Wireless Communication Systems	Uppsala University
Renewable Energy Technologies	Politecnico di Milano, Colorado State University
Nanotechnology	Harvard University, University of Massachusetts, National University of Singapore
Anthropology Management	University of Ghana
Economics	University of Amsterdam
Environment Sciences	University of California Davis
Antenna Design & Development	University of Trento
Robotics	University of New Mexico, Universitat Politecnica de Catalunya (UPC), Carnegie Mellon University, TU Munich
Sensor Systems	Uppsala University,
Deep Learning	Boston University, University of Missouri
Computer Human Interaction	UMass, TUMunich
Haptics	EPFL Lausanne
Educational pedagogy	Stanford, UC Berkley, Tel Aviv University, University of Twente

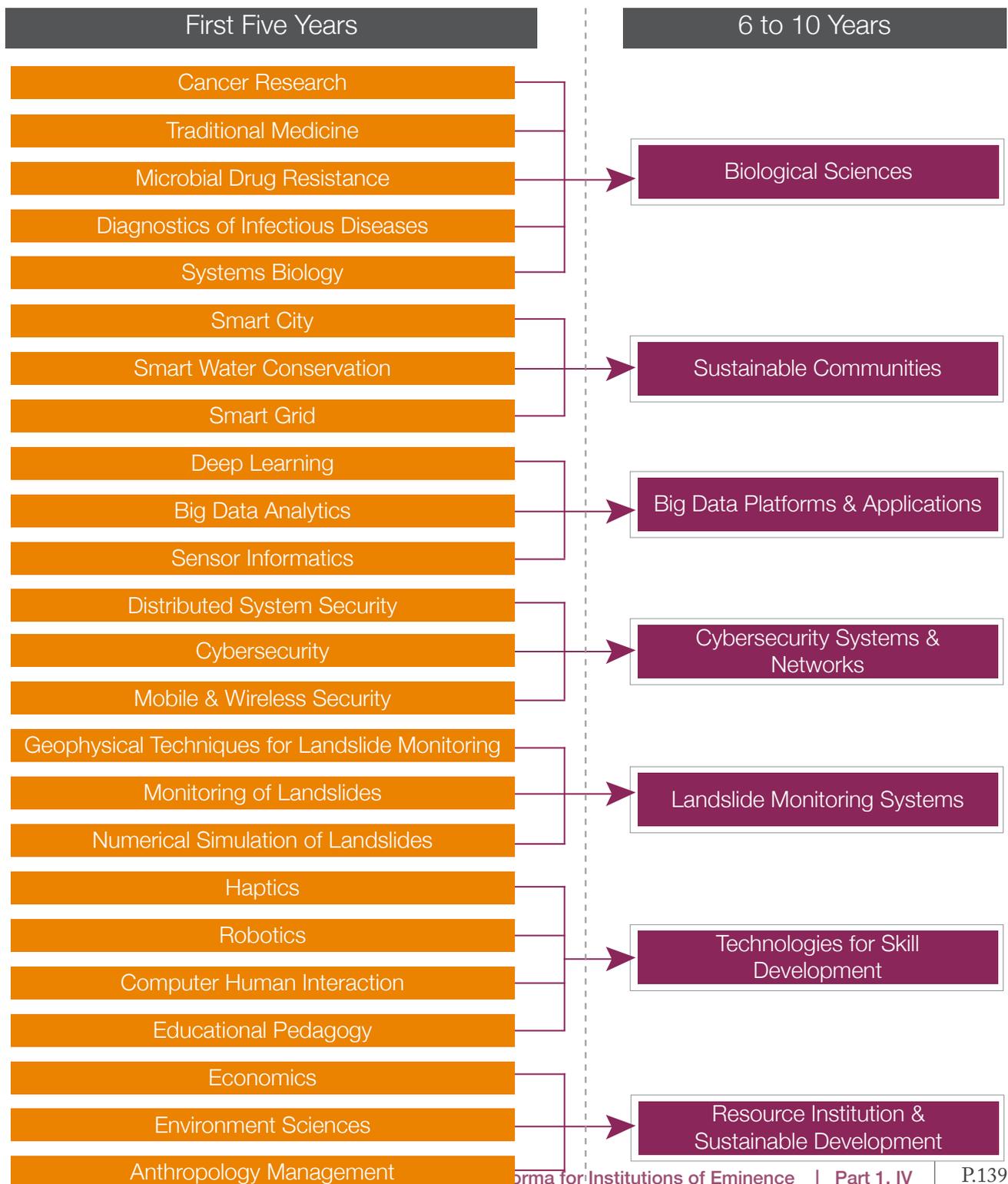
These joint research programmes will lead to joint/dual educational programs, joint publication, co-advising of master's and Ph.D. students, joint proposal writing, joint project initiation, etc..

Year 6 to Year 10

Focus on increasing the number of Joint Centers of Excellence

Partnership with top universities and industries to form joint Centers of Excellence based on our existing strengths as well as our strategic thrust areas.

A decade-long collaboration with international institutions has led to the identification of key partners who are interested in jointly developing centers of excellence in thrust areas of research, for example, the Center for Data Analytics Research initiated with University at Buffalo. This effort will be further accelerated in the next few years, and we are in discussions with our collaborators to develop the centers listed below.



Joint Research Center	International Partners
Big Data Platforms & Applications	University of Louisiana at Lafayette, University of California San Diego, Boston University
Cybersecurity Systems & Networks	Vrije Universiteit Amsterdam, Grenoble INP, University of Helsinki, Aalto University
Resource Institution & Sustainable Development	University of Amsterdam, University of Ghana, Kumasi, East Carolina University, RMIT ANU SANDEE Network
Technologies for Skill Development	EPFL, Technical University of Munich
Landslide Monitoring Systems	Politecnico di Milano, Italian National Research Council (CNR), British Geological Society, King's College London
Sustainable Communities	EPFL, University of Trento, Stanford University
Biological Sciences	University of Oxford, University of Cambridge, University of Washington, Vrije Universiteit Amsterdam

We plan to set up a network of international offices, in Frankfurt for the European continent, in Chicago and San Ramon, CA, for North American region, in Singapore for South Asian countries, in Dubai for the middle East, in Nairobi (Kenya) for Africa, and in Melbourne for Australia. Additionally, we plan to conduct town hall meetings annually at our international offices at the start of admission seasons, for prospective students.

Year 11 to Year 15

Strengthening the partnership with top universities and industries further.

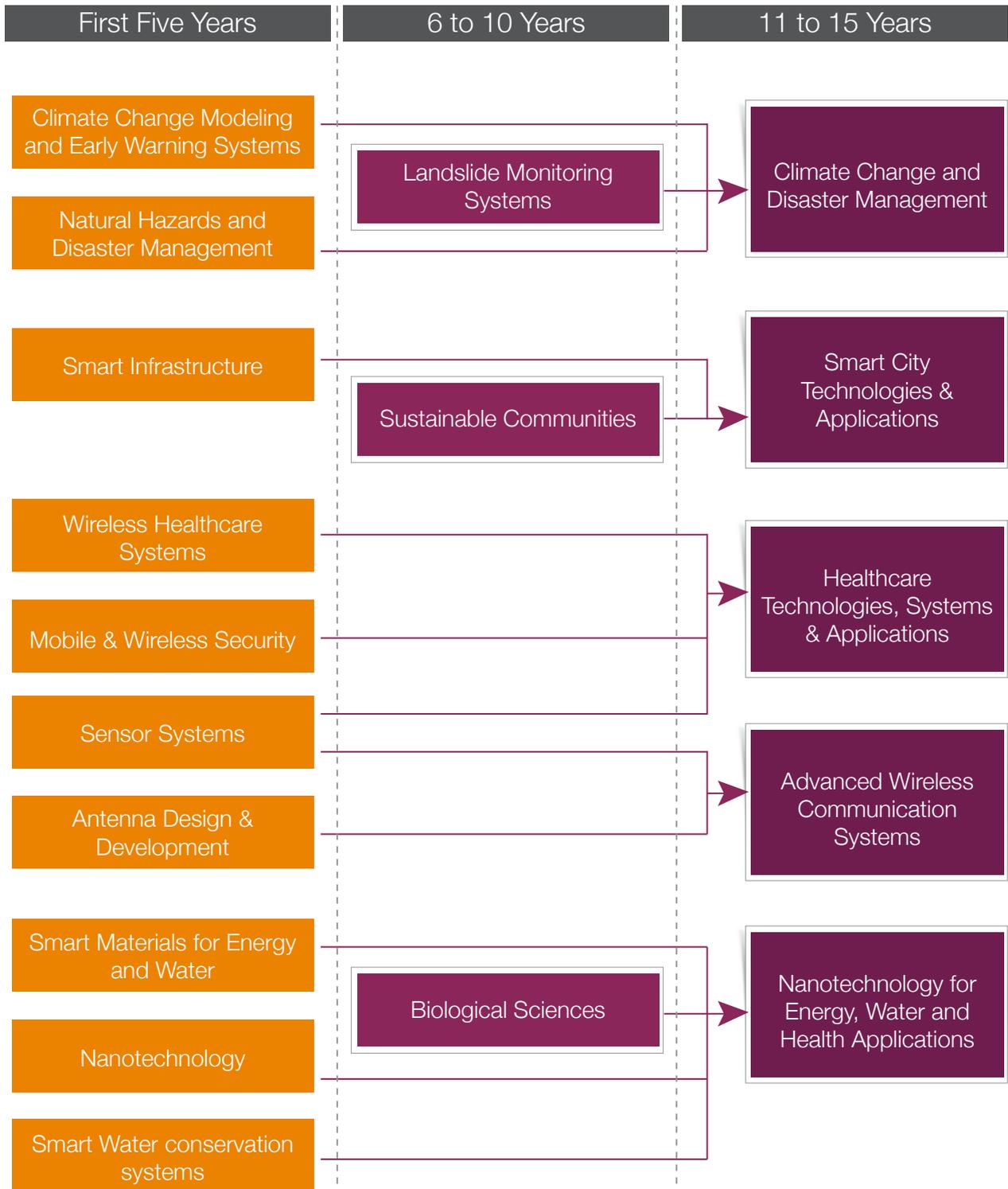
Joint Research Center	International Partners
Climate Change and Disaster Management	Kyoto University, Uppsala University
Smart City Technologies & Applications	University of California, Irvine, Technical University of Munich, KTH, Politecnico di Milano, VTT Finland, Colorado State University
Healthcare Technologies, Systems & Applications	University of California San Diego, ETH Zurich, University of California Los Angeles, Technical University of Munich
Advanced Wireless Communication Systems	Uppsala University, Colorado State University, University of California Davis
Smart Materials	Penn State, Columbia University, University of Manchester, University of Ireland
Nanotechnology for Energy, Water and Health Applications	Stanford University, University of Connecticut Health Centre, Rice U, Houston, Northeastern U, Boston U, Harvard U, Brigham and Women's Hospital, University of Colorado, University of Massachusetts, National University of Singapore, Monash University, Australia.

Increase the number of offices across the globe to extend the reach

We will develop strategic alliances with top ranked universities and research institutes in the world to develop global networks in specific areas such as climate change, robotics, sustainable development, smart materials etc..

Strengthen the Amrita brand from an international perspective.

Develop Amrita to be the destination of choice for higher education from African, SAARC and South East Asian countries.



Part 1. IV. h

Networking plan outlining teaching and research collaborations and partnerships, leading to research dissemination.

Networking plan

One of Amrita's major strengths is in the area of research and teaching collaborations with distinguished national and international partners. In 2004, within one year of establishment, we initiated a major joint project with ISRO to use the EDUSAT for networking numerous universities all over India and utilize distinguished international faculty to come and deliver courses over this

network. We were recognized by the Govt. of India for having pioneered this networking for teaching and research between Indian and US universities, culminating in a landmark first ever Indo-US inter-university MoU during the Indian prime minister's visit to the US. This network, led by Amrita, brought together 20 of the top 100 ranked US universities with eminent Indian universities.

Years 1-5: Enhancing Collaborative Projects.

Memorandum of Understanding with Globally Renowned Universities and Industries

Amrita has identified specific areas to initiate research and networking collaborations with industries and globally renowned university. Some of the major areas identified are nano sciences, cancer research, Biomedical Instrumentation, E-learning technologies, Disaster Management, Smart Grid,

Health Informatics, etc.. In the first five years we expect to sign maximum of five memorandum of understandings with the organizations such as Larsen & Turbo, ABB, TCS, IIT Mumbai, Geological Society of India, National Disaster Management of India, WIPRO, Maxim Intregrated etc..

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A-VIEW E-Learning Network

A-View is Amrita's nationally recognized and adopted e-learning network and platform that connects 11,000+ institutions. This flagship network platform provides an immersive e-learning experience like a real classroom. We intend to add at least 1000 institutions per year to reach a target of 16000 by the end of five years.

Amrita Virtual Labs and OLabs

It is a collection of 91 virtual laboratories containing hundreds of experiments in

nine disciplines of science and engineering, devised as part of a comprehensive undertaking to provide easily accessible and high-quality education throughout India. The current number of 140 nodal centers will be expanded to over 350 by the end of five years. OLabs, which focuses on science experiments for Schools, will target 10000 schools in the first 5 years training over 30000 teachers.

Live-In- Labs

Program which networks students from Amrita and thirty partner international universities to come up with scientific and technological solutions faced by rural population in developing economies. As per our plan, we are initiating 70 frugal-innovation research projects for the disenfranchised active in 21 states and 32 centers impacting 60,000 rural villages.

Amrita Faculty to External Faculty Networking:

- All Amrita PhD faculty will connect with national or international faculty/researchers to develop teaching and research collaborations.
- Faculty will participate in collaborative workshops, conferences, or training programs, which will enhance research and teaching networking. Special scholarship programs has been initiated at Amrita to enhance the participation in conference and workshops by the faculty community.
- Amrita PhD faculty will guide several PhD candidates, and each candidate will have an international co-guide or doctoral committee member.
- Amrita senior faculty members with Ph.D. degree and more than 10 years of experience are encouraged to be part of doctoral committee of Ph. D. scholars in other esteemed universities.
- Faculty will be expected to participate in networking proposals of multiple partners, and will be requested to join at least one international networking group.
- Start Campus Chapters of professional associations such as IEEE, ACM, etc..
- Start Department level research collaborations between faculty communities in both universities

Amrita Student to External Faculty Networking:

We will invite national and international research and teaching faculty to a member of the

- Board of Studies of Master's programs
- Doctoral committee of PhD scholars
- Co-guiding Master's Thesis

Conferences

Conference series are important avenues for Amrita's researchers and faculty to network with peers from both national and international institutions. Amrita will actively build upon the conferences listed below and actively organize more such conferences.

- United Nations Academic Impact. New York
- ICTEE- IEEE International Conference on Technology Enhanced Education - participation from MIT, Carnegie Mellon, UC Berkeley, India's IITs and NITs.
- UNESCO Chair on Women Empowerment and Gender Equality Conference
- The conferences will include premier "competitive" events such as ACM's Inter-collegiate programming contests, Formula Racing Car events, & Pitchfests.
- International Conference Series on Robotics & Automation for Humanitarian Applications,

SCICON'16, Wireless, Cybersecurity, Nano, BioQuest, medical conferences, and many more conferences held at Amrita

At least one conference per two years on the research thrust areas will be organized to enhance the dissemination of Amrita research outputs and to develop new research collaborations. Along with conferences organized in thrust areas, conferences will be organized in the emerging science & technology, societal applications, and innovation. In the upcoming years, conferences/ workshops will be organized in the following areas:

Year 1: Renewable Energy Technologies, Health Informatics

Year 2: Climate Change & Disaster Management, Cancer Research

Year 3: Gender Equality & Women Empowerment, Smart Grid

Year 4: Clean Water, E-Learning technologies

Year 5: Sustainable & Resilient Communities



Hosting of Summer Camps and Winter Schools

Summer & Winter Schools:

Schools of a few days addressing critical global areas, presented by invited experts.

- These courses to a variety of learners, including college students, Government organizations, industries, NGOs, etc., as part of their life-long learning and skill development process.
- Hands-on approach to learning will be a mandatory teaching methodology at these schools.

Seminars:

- One to 4 day programs inviting national and international faculty.
- Courses provide exposure to emerging areas of high topical interest as derived from strategic objectives of respective schools.
- Every department will host seminars and workshops each year.

Year 6-10: Establish Joint Centres for Research and Development.

Establish Joint Centres for Research and Development:

- Initiate Research Collaborations and Setup Joint Research Centers with Academic and Industrial Partners.
- Develop R&D areas with national and international academic & industrial partners.
 - Will identify common objectives, of relevance to India and the World.
 - The centers will be built on a 'Self-Sustenance Model' through gathering of funds to support infrastructure and stipend of research staff.
- The resulting collaborative research outcomes will be scaled from an entrepreneurial perspective.
- Within the first 10 years, we will excel in collaborations already in progress and build new ones with partner universities, industries, and NGOs, such as the following:
 - **Robotics** - Amrita, ABB, UNM, UPC, TU Munich, CMU
 - **Water** - Amrita, UNESCO, USC, TU Delft, Columbia
 - **Smart City** - Amrita, IBM, TCS, Infosys, POLIMI, UC Irvine
 - **Experiential Learning** - Amrita, EPFL, TU Munich, Stanford, Ryerson
- Establish Center of Excellences

Research Fellow Program and Collaborations through Sabbaticals

- Established visiting research faculty will be invited to spend 3-6 month sabbatical terms at Amrita through the Research Fellow program.
- Amrita faculty will spend 3-6 months in partner universities to establish close connections around research with like-minded faculty.
- Amrita faculty will be offered travel incentives to spend 3-6 month sabbaticals overseas once every 2 years.
- Amrita faculty will be expected to utilize these opportunities as part of expanding their individual networks.

Year 11-15: Discipline specific plans for collaborations

From the 10th year onwards systematic processes listed below, will be established across all university departments.

- Faculty Interaction
- Faculty Exchange programs
- Student Exchange Programs
- Host Conferences
- Joint Proposals with external Institutes
- Industry participation in research and curriculum development
- Setup Joint Research Centers
- Setup Centers of Excellence
- Well developed Phd Program



Collaborating Government bodies & Industry

Strong collaboration with national and international organizations is a hallmark of Amrita's high-end research. Representing several continents (North & South America, Europe, Middle East, Asia Pacific, Africa), our partners include top universities around the world such as MIT, Stanford, Oxford, KTH, NUS, and EPFL. Nationally, major laboratories and industry leaders are also partners, including TIFAC, DST, ISRO, DIT, DRDO, Microsoft, HP, Infosys, MDS Pharma, and Biocon to name a few. Indian government agencies (e.g., Ministry of Human Resource Development's National Mission for Education) have also been partners with Amrita projects and research.



Part 1. IV. i

Existing and proposed infrastructure with financial repercussion and timeline for development

Infrastructure Development Plan

This Infrastructure Plan outlines an innovative and strategic value approach to sustaining a vibrant institution that requires world-class facilities and resources. This plan is intended to guide the direction of the Amrita over the next 15 years in its efforts to address priority infrastructure building needs that meet and align with the strategic academic and research priorities of the University.

It encompasses all the dimensions of capital planning at the Institution, including physical assets such as buildings, space, land, information and communications technology, equipment, critical maintenance, and renewal. The importance of maintenance and construction of state-of-the-art physical assets will support Amrita to pursue cutting edge research, thus enhancing its ability to maximize advantages in research, educational, and operational opportunities.

To accomplish the objectives set out in the various plans, critical investments in various areas are now outlined, key among them being development of facilities along green and sustainable lines.

The planning and design of new and redeveloped facilities include a systematic process of functional planning, budgeting,

conceptual design, elemental costing, detailed design, cost estimating and commissioning. This process will ensure no surprises and the construction of facilities that are efficient and effective to build, operate and maintain. Facilities must be purpose built yet flexible to facilitate ongoing changes in curriculum, research and technologies.

Amrita's Campuses are designed with the goal of enriching campus life and providing an optimum academic atmosphere. The use of physical resources of all kinds aims to promote the University's academic goals. A unique aspect of Amrita's campus is that it has more than one million plants and trees.

At present Amrita has 938 acres, out of which 99 Lakh sq.ft is the built up area.

Years 1 - 5

During the 1st 5 year plan, Amrita will enhance and upgrade the following existing facilities to make them best-in-Class and state-of-the-art.

- Classrooms / Smart classrooms
- Lecture halls
- Conference rooms
- Meeting rooms
- Auditoriums

- Research Labs
- Manufacturing Labs
- Maker Labs
- Computational Labs
- Robotic Labs
- Biotechnology Labs
- Wireless Labs
- Medical Labs
- Libraries, Physical and Digital
- Sports complexes
- Play Ground
- Jogging Track
- 15 KM Nature trail for walking
- Gymnasium
- Swimming pools
- Prayer Halls
- Campus WiFi
- Ample Parking Spaces
- Technology Business Incubator
- Student Needs Centers
 - Banking
 - Reprographics / Photocopy centers
 - General stores /
 - Medical Centers
 - Parks
 - Hostel
 - Canteen
 - Food mess
 - Student activity clubs
- Staff / Faculty Residences
- Centralized Kitchen catering to

Various Cuisines

- Guest Houses
- Effluent Treatment Plants

Years 6 - 10

During the second five year period

- Centers of Excellence
- Additional classrooms
- Additional Labs to cater to the expanding needs of the researchers
- International hostels
- Shopping malls
- Additional parking lots
- Indoor stadiums
- Food Court
- Pharmacy
- Mechanized laundry

Years 11 - 15

- Mechanized Laundry
- Convention Center
- Restaurants
- Additional Classrooms
- Additional Labs to cater to the expanding needs of the researchers

Additional Hostels

Financial Outlay for Land & Buildings - Ins Rs. Crores

Year	Yr.1	Yr.2	Yr.3	Yr.4	Yr.5	End of Yr. 10	End of Yr. 15
Totals	391	345	380	286	260	1385	1200



New Campus at Delhi NCR (Work Under Progress)





New Campus at Delhi NCR (Work Under Progress)



Upcoming Student Hostels

Part 1. IV. j

Administrative plan for getting accreditation from National and International Agencies as well as marketing and promotion.

The quality assurance cell is an important function of the Amrita administrative process. Amrita has been accredited by the National Assessment and Accreditation Council (NAAC) twice since the University was declared as a deemed to be university in 2003. On both occasions, the University was awarded an “A” grade. The most recent accreditation was completed in Dec 2014. The internal quality assurance activity is a robust process and has been in place for more than a decade.

We plan to apply for accreditation by third party agencies such as National Board of Accreditation (NBA), Accreditation Board for Engineering and Technology (ABET), Association to Advance Collegiate Schools of Business (AACSB), and College of American Pathology CAP). The accreditation process is an added assurance that our quality assurance process is robust.

Amrita has an accreditation coordinator for all the accreditation activities, & who also monitors the conformance to quality standards in all the constituent campuses as well as the hospitals. There are various committees constituted which meet periodically so that all issues are addressed and necessary corrective & preventive actions are taken in a timely manner. The Quality and Standards department at Amrita drives all stakeholders to sustain & improve the quality of service at the organization.

Present Status

- We expect to maintain the quality to be rated at the highest grade by NAAC for all 15 years.
- Amrita Vishwa Vidyapeetham has been graded in the ‘A’ category by the Ministry of Human Resource Development Deemed University Review Committee. Amrita is placed in the ivy-league of Indian universities along with IISc, TIFR and the IITs.
- Amrita Institute of Medical Sciences (AIMS) is the only teaching hospital in India with NABH accreditation.
- The school of medicine & the hospital are accredited with NAAC, NABH, NABL, and ISO (9000: 2015, 9002-2000, 14000: 2014 & 18000: 2014) certified. The top management of the organization is committed and striving hard to sustain & improve the quality of health care delivery.

Plan for Accreditation

Years 1 to 5

Engineering

23 Programs by NBA

- M.Tech in: VLSI, CSE, Automotive Engineering, Embedded Systems, Cyber Security, CEN, Structural & Civil Engg.,

Material Science & Engg, Wireless Networks & Applications, Cyber Security Systems & Networks, Renewable Energy Technologies, Remote Sensing & WSN, Engg. Design, Biomedical Engg., CVIP, Robotics & Automation, Manufacturing Engg., Power Electronics, Thermal & Fluids Engg., Power & Energy Engg., Thermal Science and Energy Systems, Control & Instrumentation Engg., and Communication Engg. & Signal Processing

8 programs by ABET

- B.Tech in: ECE, EEE, Mech Engg., CSE, Civil Engg., Aerospace Engg., Chemical Engg., EIE

Medical Sciences

1 Program by CAP

- Pathology

Other Accreditation Plans:

- Sustain healthcare accreditation
- International Accreditation like JCI
- Food Safety ISO standards
- National Certification of Excellence: Nursing Excellence

Management

- MBA program by AACSB

Years 6 to 10

Medical Sciences

- Working with National Agencies
 - Ministry of Health & Family Welfare (National & State)
 - Indian Council for Medical Research

- National Accreditation Board for Hospitals
- Hospital Infection Society of India

Years 11 to 15

Medical Sciences

- Working with International Agencies like
 - World Health Organisation
 - Centre for Disease Control, US
 - Institute of Healthcare Improvement, US
 - National Institute of Healthcare Excellence, UK
 - International Confederation for Health Outcome Monitoring, US
 - Society for Healthcare Epidemiology, US
 - Association for Professionals of Infection Control, US

Marketing & Promotion

Our marketing and promotion plan focuses on both internal and external audiences. Primary audiences include prospective students and faculty, researchers, industry, community members, alumni and internal Amrita community. Our plan seeks to reach these groups on the local, regional, national and global levels.

The Specific Goals include:

Years 1 to 5

- Reimagine the function of 'Marketing and Promotions' within Amrita.
- Revisit Brand Guidelines to ensure consistency across all visual media.

- Redesign and manage the Amrita web site, and establish a set of new-age web content guidelines.
- Strategize for External Communications - Domestic and International.
- Support institutional enrollment goals for all programs.
 - Participate in international fairs to recruit students, especially from SAARC countries.
 - Organise training programs in emerging areas, specific camps in SAARC, Africa, etc..
 - Advertise through mass media, internationally recognised journals & magazines.
- Increasing the Brand Awareness & Reputation of Amrita across top Indian and global universities
 - Conduct & host international competitions.
 - Conduct & host international Conferences/ Workshops/ Symposia/ Seminars
- Support initiatives to attract and retain top talents in the areas of research and academia.
 - Participate in world ranking summits and host an international ranking summit at Amrita in 2019 with THE.
 - Arrange annual foreign tours, establishing booths and other possible promotional activities.
 - Share Amrita's research work at Research Gate, academia.edu

- Research videos, brochures etc..
- Research promotion through the respected online resource, Nature.org
 - Ensure every faculty has Google scholar profile page.
- Help programs to better connect with the alumni community.
 - Integrate alumni portal with web portal
- Support for improving industry collaborations.
 - Corporate relations brochure, videos etc..
- Support internal communications to staff, faculty and student communities, who are spread across diverse programs and departments.
- Connect better through strong presence across all social media platforms.

Years 6 to 10

- Develop an integrated content strategy for all print and digital materials.
 - Organize content marketing and digital first.
 - Clear usage guidelines for web, email, printed material, signage, etc..
 - Develop creative examples for brand look, feel and brand voice.
- Develop a collaborative platform for all marketing, promotion, and content management teams across Amrita.
- Expand the office of marketing and communications to every campus.
- Strategize for external communications - domestic & international.

- Support institutional enrollment goals for all programs.
 - Participate in international fairs to recruit student especially from SAARC countries.
 - Create campus life videos for international & domestic students.
 - Special web portals for foreign students.
- Increase the brand awareness & reputation of Amrita across top Indian and global universities.
- Support initiatives to attract and retain top talents in the areas of research and academia.
 - Today Amrita is ranked 28th in India in the Webometrics Ranking of World Universities. Our goal is to be among the top 10 in India in the next ten years.
 - Help programs to better connect with the alumni community.
 - Support for improving industry Collaborations.
- Support for internal communications.

Part 1. IV. k

Governance plan elaborating the proposed Institutional structure and how it overlaps with ownership, decision-making process and social engagement.

Amrita Vishwa Vidyapeetham was established by Mata Amritanandamayi Trust, and is wholly owned by them, under the leadership of the world renowned humanitarian leader, Her Holiness Sri Mata Amritanandamayi Devi, popularly known as “Amma.” While the general academic objectives of most eminent higher education institutions (HEIs) tend to have several commonalities with those of Amrita Vishwa Vidyapeetham, a key distinguishing factor is the unique positioning achieved due to the universal vision and global experience of Amma. This is largely based on her interactions with people from all walks of life across the world. This aspect brings a greater sense of purpose, greater connectedness with real problems of the world, provides a deeper humanitarian foundation and human values into the functioning of the institution, across all its constituent levels.

While the organization structure allows for efficient, data-based, goal-oriented and ethical decision-making, it may be noted that the more critical and long-term decisions are guided by the immense experience of the Chancellor of Amrita Vishwa Vidyapeetham, Amma – capitalizing on her wealth of experience, insight, and foresight. Additionally, in view of the excellent and unique track record of Mata Amritanandamayi Math (partnering with Amrita Vishwa Vidyapeetham) in creating and implementing massive scale humanitarian development and

relief projects, the institution is most advantageously positioned to serve the needs of society (locally and globally) through all of its activities.

Thus, it is not only inevitable, but significantly desirable, that there should be some overlap (as outlined above), in the structure, decision-making, and social engagement between Amrita Vishwa Vidyapeetham and its sponsoring trust, each complementing the other’s strengths, capacity, and purpose.

The current governance structure of the institution is based upon four broad divisions:

During the 1st 5 year plan, Amrita will enhance and upgrade the following existing facilities to make them best-in-class and state-of-the-art.

- Leadership and Management to steer and guide the functions in alignment with the vision, mission, goals and objectives of the institution
- Administrative Committees to allow streamlined and focused assumption of operational responsibilities, to facilitate the non-academic activities that support and complement the academic endeavors.
- Faculties: to establish normative and interdisciplinary academic groupings within each of which the activities of teaching, learning, and research facilitate the achievement of degrees,

diplomas, and scientific research and development objectives, thereby meeting diverse societal needs at both the local and the global levels

The governance plan was developed with the following underpinnings and objectives:

- To establish a healthy eco-system that has significant representation from the key social actors and agencies, such as the government, faculty, alumni, students, sponsors, and employers.
- To evolve, implement, and monitor a regulatory framework in alignment with the government regulations, institution's vision and mission, stakeholder requirements, and global best practices. This will subsequently enable the various functions and operations to be guided, controlled, and harmonized by the framework.
- To establish national and global partnerships, and play a significant role in producing high quality, innovative research and development output that is consistent, sustainable, ethical, and efficient.
- To develop, nourish, and produce well-trained, responsible, globally competent human capital who contribute to economic growth and living by universal, holistic values. This will help support critical societal needs, and in general bring sustainable prosperity to the world.

- To assure transparency and honesty in all functions, mechanisms, regulations, and operations of the institution
- To demonstrate accountability at all levels and in all roles, and fair participatory decision-making.
 - To establish a culture of, and mechanisms for, excellence and continuous improvement in all aspects of the institution's performance.

The primary governing bodies within the ambit of Amrita Vishwa Vidyapeetham:

- Board of Management
 - Academic Council
 - Administrative committees (Standing committees and ad hoc committees)
 - Internal Quality Assurance Cell
 - Faculties (comprising schools, departments and centers)
- Administrative bodies (non-academic)

Amrita's Proposed Additional Committees

- Executive Committee (Years 1 - 5)
- International Advisory Committee (Years 1 - 5)
- Faculty Student Committee (Years 6 - 10)
- Visitors Committee (Years 11 - 15)

The Executive Committee

- Responsible for general administration and superintendence of all matters relating to the Institution
- Meets regularly during the academic year.
- Is chaired by the Chair of the Board

The agenda of the Executive Committee typically includes such topics as developments in interdisciplinary education and research, student recruitment, admissions and financial aid policies, student life, campus planning, external relations, the sponsorship of research; and changes in the senior administration. The Committee devotes substantial time to the discussion of budget processes, financial planning, and the management and enhancement of the Institute's resources.

International Advisory Board (IAB)

- The Board will consist of world renowned Subject Matter Experts, distinguished academics and researchers.
- Is charged with guiding Amrita towards global excellence
- Meets annually for the first five years and then bi-annually from there on.

The agenda of the International Advisory Board includes guiding Amrita towards world class research, help to develop an internationally competitive curriculum, and advise on international student affairs and well being.

Faculty Student Committee (FSC)

The committee provides additional means for bringing student and faculty representatives into regular communication with the institution on matters of long-range importance to the Amrita community. The

FSC also gives students a direct opportunity to work closely with faculty on implementing policy reforms on a campus-wide level.

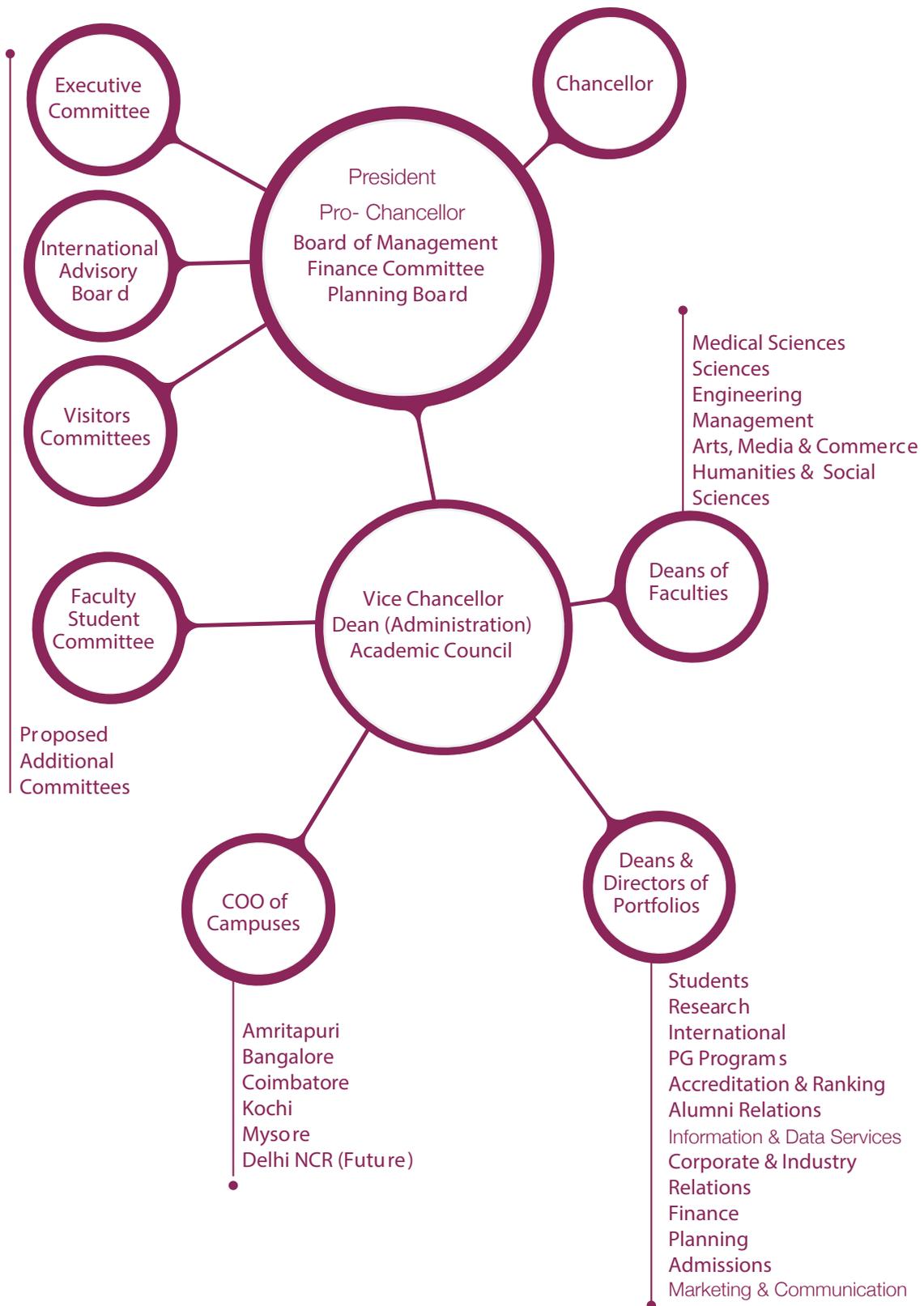
- The committee is the principle group for student excellence
- The committee serves to acquaint the community more fully with the Institution and help integrate Student and Corporate Social Responsibility.

Visitors Committees

The committees operate as advisory groups to the Institution and the administration

- Offering appraisal, advice, and insight on each academic program
- Alumni Network that provides industry insight
- Guides on other major activities at the Institute,
- Supports the
 - Board of Studies
 - Offices of the Deans
 - Research Centers

Governance Structure - Amrita Vishwa Vidyapeetham



Part 1. IV. I

Clarify as to how Governance plan will be committed to the highest global standards of transparency, accountability and efficiency.

Responsibilities and accountabilities are to be delegated, assumed, and owned by members of the governance structure. Transparency is a part of the DNA, the organic nature of the university, in addition to being a result of executive action. Keeping this in mind, transparency, accountability and efficiency will be achieved on principles of collaboration.

Collaboration by Design - Shared Governance

Shared governance requires collaboration through established structures and procedures between the institution's administration, Academic Council, various committees and deans. Shared governance requires such collaboration to maximize diverse perspectives, promote a sense of efficacy among members, and enable administrative leaders to make informed choices about policies and resources.

The vast majority of instances of shared governance carry the burden of careful collaboration wherein appropriate academic bodies and administration have reached general agreement. General agreement means that appropriate representatives and administrators, through a spirit of mutual respect, have weighed matters and options and have reached consensus.

The University President or designee(s) may sometimes make a final decision that

is not the outcome of general agreement. In these cases, the President or the President's designee will provide the Institution leaders with an explanation for why such actions were taken.

Shared governance establishes the ethos and structures that enable divergent ideas to be placed on the table, debated for their merits, shaped for the larger good of the institute's academic community, and put to use in a timely manner. Shared governance is the keystone that enables the Academic Council and the administrative leadership to sustain and advance the university's mission, effectiveness, and reputation.

Faculty and academic professionals generate significant funding and research, create and sustain the academic stature of the institution, broaden the horizons and citizenship of students and society, and establish and extend future fruitful alumni relationships. Because of these important contributions by the faculty and academic professionals, a commitment to shared governance is essential to the advancement of the institution's mission. At a minimum, shared governance leads to better decision-making, stronger collegiality, and the construction and maintenance of relationships of trust and mutual accord. It sets for all to see an extensive example of democratic governance, warranties that decisions are based on a vast array of pioneering knowledge and information, and

ensures that policies and actions are based on long-term values rather than short-term goals.

Structure and Processes for Transparency, Accountability and Efficiency

University-wide committees will consist of faculty, administrators, and members of other sectors of the University community, as appropriate. Faculty and administration shall make every effort to accommodate one another's needs, to achieve balance between faculty and administration perspectives, and to achieve fair representation of gender and cultural diversity in committee composition.

Decision-making in universities is dispersed. Research Centers, Schools, Labs, Departments, and Centers of Excellence all have the capacity to enact some policies and certain procedures within their own sphere of operation.

Standards & Accreditation

“Assessment and accreditation is broadly used for understanding the “Quality Status” of an institution. In the context of Higher Education, the accreditation status indicates that the particular Higher Educational Institutions (HEI) – a College, a University, or any other recognised Unit therein, meets the standards of quality as set by the Accreditation Agency, in terms of its performance, related to the educational processes and outcomes, covering the

curriculum, teaching-learning, evaluation, faculty, research, infrastructure, learning resources, organisation, governance, financial well being and student services.” - NAAC Rational

Amrita is a NAAC grade “A” accredited institution currently in its 2nd cycle, and will be due for its next cycle in 2019. This re-affirms our commitment to providing quality higher education.

NAAC assesses the following seven criteria to serve as the basis of its assessment procedures:

- Curricular Aspects
- Teaching-Learning and Evaluation
- Research, Innovations and Extension
- Infrastructure and Learning Resources
- Student Support and Progression
- Governance, Leadership and Management
- Institutional Values and Best Practices

Being accredited by a quality assurance body like NAAC, all aspects, functions, processes and academics of Amrita are audited and thereby ensures transparency, accountability and efficiency.

- Amrita will put in place institutional policies and practices reflecting transparency, accountability, and efficiency given below:

- Membership of operating committees contains representation and/or feedback mechanism from all constituents of the institution and its ecosystem (e.g. student members in the Internal Quality Assurance Cell, alumni members in the Board of Studies, feedback from parents and employers on curricular design, etc..)
- Release of comprehensive performance data via annual reports and newsletters to stakeholders and global citizens; publication of annual quality assurance report on the institution web portal (including financial data); fee structure, admission policies and procedures, academic and administrative policies, etc.. via web portal and handbooks; etc..

- Fairness and equity in faculty and staff recruitment, work allocation, promotion, and student admissions and scholarships.
- Student assessment and grading policies and methods (including round-robin assessment, and options for reevaluation), etc..
- Grievance-redressal mechanism / Feedback mechanisms
- Cradle-to-grave academic and administrative management system via an Enterprise Level Cloud Based Solutions

Below is the list of accreditations that Amrita will be assessed by towards its march for Global Excellence

Key Performance Indicators	Current	Years 1 to 5		End of Year 10	End of Year 15
		Year 1	Year 5		
NAAC	'A' grade	Highest	Highest	Highest	Highest
ABET	No	Start	Yes	Yes	Yes
NBA	No	Start	Yes	Yes	Yes
NABL	Yes	Yes	Yes	Yes	Yes
NABH	Yes	Yes	Yes	Yes	Yes
AACSB	No	No	Yes	Yes	Yes
Others	Healthcare - ISO 9002-2000	ISO Certified	ISO Certified	ISO Certified	ISO Certified
International Accreditation	No	No	No	No	Yes

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Part 1. IV. m

Plan for involving the alumni in the management of the Institution and leveraging alumni financial resources.

Amrita has distinguished alumni all over the world in all walks of life. Our alumni have presence in prestigious educational & research institutions, various departments of the government, established industry leaders, world class health care organizations, and in the performing arts industry. We also have a good number of trailblazers who have started up companies and non-profit organizations for the up-lifting of the underprivileged.

The university believes that each and every alumnus is a brand ambassador of the university, and can make a definite as well as positive difference to the growth of the university. Amrita Global Alumni Network (AGAN) is the mother network of alumni and all separate schools under Amrita will have a focused network of their alumni. The separate networks are all linked to AGAN and will work on a common theme.

The plans for involving alumni in the management and leveraging of financial resources are as follows:

Years 1 to 5

1. Restructure the diversified alumni associations to become chapters of the Amrita Global Alumni Network. (AGAN) and revise the by-laws of the alumni associations so that they become entities of AGAN.
2. Establish a framework to register new Alumni Chapters to AGAN.
3. Conduct annual elections to the Alumni Association for selecting the office

bearers.

4. Expand alumni reach by increasing the number of Alumni Chapters to 10 national and 10 international chapters. (20% active alumni).
5. Promote alumni association activities using online alumni web portal, chapter meets and online events.
6. Engage at least 2.5% of AGAN members in seminars, symposiums and workshops conducted by various schools to learn the current trends in the industry.
7. Institute a framework and corpus for distinguished alumni awards
8. 20% of the Board of studies of different programs will be 'Distinguished Alumni'.
9. Conduct 'Alumni Boot Camps' where alumni provide inputs to students on career planning.
10. AGAN to account for 20% of internships offered in the campus and 10% of the placements through recruitment process.
11. Establish a 'Family Care Program' (special privileges at health care and educational facilities at Amrita) for AGAN members.
12. Involve at least 5% of alumni in the societal impact programs at Amrita.

Years 6 to 10

1. Practical one-to-one or small student group mentoring by alumni preferably involving their own employers.

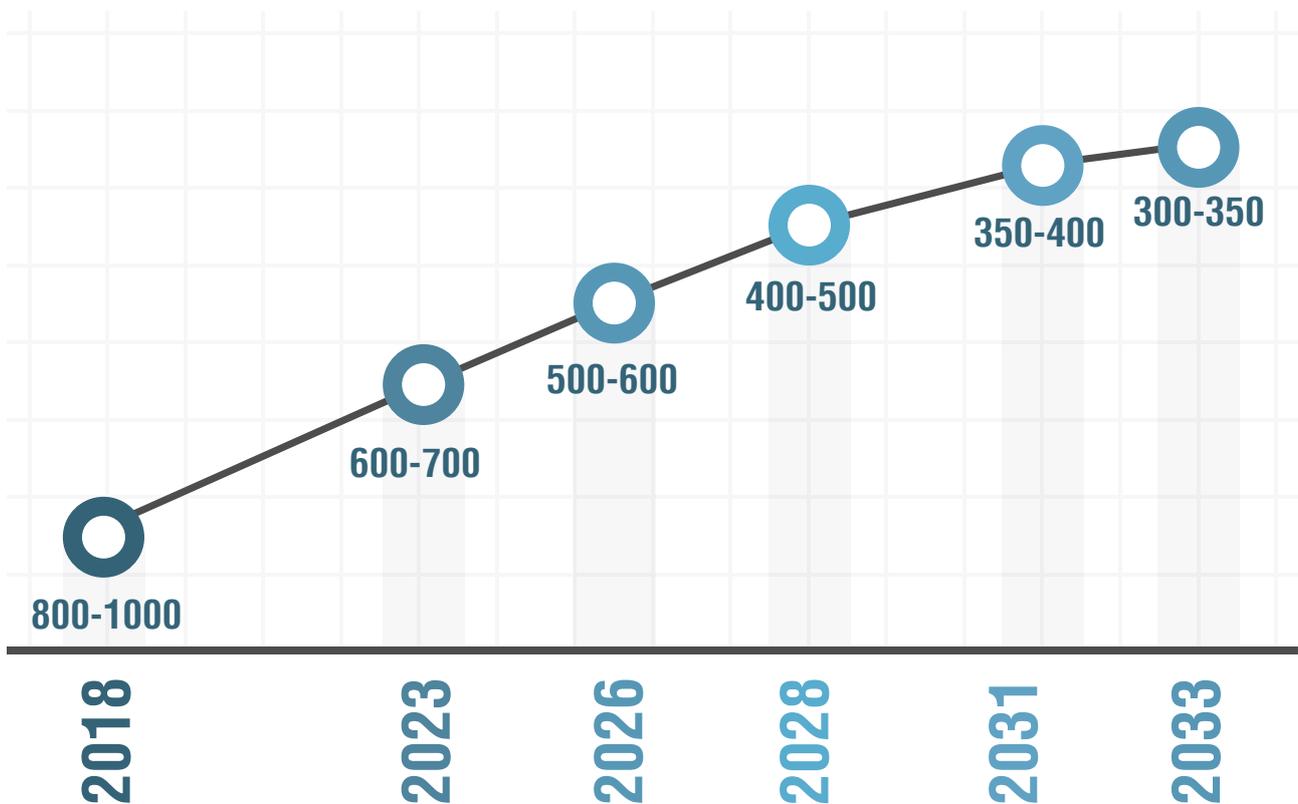
2. Establish at least 50 active chapters.(40% active alumni).
 3. Infrastructure development utilizing AGAN Corpus Fund
 4. Establishing additional research facilities at Amrita through AGAN donations and funding.
 5. AGAN to account for 40% of internships offered in the campus and also 30% of the placements through recruitment process.
 6. Utilize AGAN to bring in international collaborations in research.
 7. AGAN platform to become center for knowledge transfer from global ndustry and research institutes to Amrita.
 8. Specialized access to Amrita TBI for AGAN members.
 9. Academically excellent AGAN members will be recruited as faculty/visiting faculty/adjunct faculty.
 10. AGAN teams to help recruit bright minds across the globe to Amrita.
 11. Entrepreneurs in AGAN assist and train students inclined to entrepreneurship.
4. Alumni career network to provide 60% of internships and 50% of placements through the recruitment process.
 5. Eminent alumni to be nominated to academic council/boards.
 6. AGAN to train faculty on latest technology in the industry.
 7. AGAN to tie-up with other university Alumni Associations (common alumni members) to create a platform for research and knowledge transfer.

Years 11 to 15

1. Support research carried out by AGAN members.
2. Non-financial support for AGAN members on sabbatical.
3. Establish at least 100 active alumni chapters (60% active alumni).

Part 1. IV. n

Intended target on possible world ranking after five, eight, ten, thirteen and fifteen years.



The World University Rankings - Projections

The present ranking has Amrita in 800 – 1000 range, our target is to be in 600 – 700 range in the first five years, and in 500 – 600 range in the eight years, 400 – 500 range in ten years, 350 – 400 range in thirteen years and 300 – 350 range in fifteen years.

Part 1. IV. o

Land details for existing institutions

Land Available at Main Campuses:

416.35 Acres

Land available at Off campuses/constituent institutions:

521.65 Acres

Area of land proposed to be acquired or to be taken on lease if any:

100 Acres in 10 years

Total:

938 Acres as of now

Details of land, location registration

Documents provided at **Annexure 4** Page AB to CD

Part 1. IV. o

A research plan indicating the research laboratories and other facilities proposed to be established. In case of humanities, social sciences and other interdisciplinary faculties, the research plan should indicate the broad areas and nature of fieldwork and research sought to be done

Following up on the comprehensive plan for research outlined in IVa (current niche areas of expertise and proposed thematic areas for future research) and IVf (comprehensive plan for establishment of laboratories), further elaboration is provided below for the two large disciplines of Medical Sciences and Engineering and their specific core research that serves as the foundation for most of our proposed interdisciplinary thrust areas:

Medical Sciences

Nanomedicine

Nanomedicines so far developed for cancer will be carried forward in further animal trials and eventually human clinical trials. This includes brain wafer, nanomedicine for drug resistant leukaemia, calcium sulphate nano vaccine, and calcium sulphate hyperthermia agents. For this purpose, Good Laboratory Practice (GLP) and Good Manufacturing Practice (GMP) labs will be completed (GMP is nearing completion and GLP work is starting) so that regulatory approvals for clinical trials can be obtained.

Nanomaterial based implants, such as bone, fat, and cartilage will be taken forward in large animal and clinical trials. Nano vaccines will be further developed and tested in preclinical trials. Nano contrast agents based on calcium sulphate for medical imaging will be tested in preclinical and clinical trials. Nano Photomedicine for brain cancer has been supported by industry for translation and this will be taken up for translational research. Testosterone delivery system has been supported by industry

and this will be developed for animal and human trials. The Raman cancer detection system for oral cancer will be miniaturized and tested in larger patient population. Screening will be started in rural areas where oral cancer rates are high. Wearable health monitoring systems will be further refined and larger field test data will be obtained and translated to industry so as to make available low-cost devices for the public. Macroscopic theranostic technologies, such as, insulin pump with glucose sensor, will undergo clinical trials. Nano-theranostic medicine, based on calcium sulphate for hyperthermia treatment of cancer has received industry support for translational research and will be translated to the clinic. 3D printed organs will be further developed for surgical planning and training of students. Patient samples will be stored in biorepositories for evaluation of biomarkers of diseases. New biorepository will be set up for this purpose.

Public Health

An integrated research group including

medical, engineering, and social scientists is a program dedicated to society that we launched years back. This program is currently running in more than 30 rural communities. This research has been enhanced by integrating it with the telemedicine network.

Epidemiological research in infectious diseases such as chikungunya, filariasis, and malaria; development of registries in cancer, tropical pancreatitis, diabetes and stroke; studies of factors associated with pediatric diseases.

Biobanking

This department, in conjunction with molecular basic scientists and clinicians, has applied for a DBT grant for biobanking. The pathology department is a major player in any biobank. We hope the biobank will be started in the coming 2-5 yrs and that it will be in the consolidation phase in the coming 6-10 years.

Maintaining molecular integrity of specimens is a major responsibility of the department. Following the initial setting up and building of the resources, the department faculty will participate in research projects as PI and co-PI. It will help provide an environment for researchers to have tissue material for research.

Computational pathology:

The milestone of establishing a digital pathology centre in the department by 2020 will propel this work substantially in the coming 5-10 year period. Artificial intelligence and machine learning on the images of pathology scanned and stored in our storage will help our expansion into this phase of computation. This will be into areas

where we find our science has limitations. This will help overcome the limitation of inter observer variation and will improve standardisation of reports, and ultimately improve patient care. We will work closely with engineers/scientists to help build the neural networks for machine learning.

Molecular Pathology:

New generation sequencing: Following achieving the milestone of setting up of molecular diagnostic lab by 2019, the phase of 5-10 years will be to consolidate from single gene analysis to multigene analysis, contributing to further define, refine, and understand diseases and their characterisation. It will be a challenging phase during which we will build the bioinformatics personnel/resources to tackle the information obtained from these exercises.

Cellular & Molecular Biology

Studies based on genetic screening of single gene variants, small gene regions, and targeted mutation analysis.

Studies based on Fragment analysis, STR marker analysis, SSCP, analysis, real-time PCR based assays.

Studies based on integration of clinical departments coordinating the diagnostic tests, and streamlining the process of including the rapidly changing test recommendations and guidelines.

Development of rapid diagnostic tests.

Virology

The AIMS Clinical Virology Laboratory aims to provide a full range of diagnostic services for the detection and monitoring of

viral illnesses in both the adult and pediatric patient populations at our hospital and nearby satellite care centers. Sub specialty areas for diagnostics will include molecular virology, genotyping and antiviral testing, viral immunodiagnostics, virus serology and culture, maintenance and stocking of medically relevant viruses and human specimens for importance.

Genomics

Modern medicine is moving towards individualized care where the genetic composition of the patient will play a crucial role. The mapping of the human genome more than a decade and a half ago has made this new approach possible. Historically, it has been the experience that one dose does not fit all, leading to suboptimal outcome and adverse effects for patients. To aid accurate diagnosis, a second Sanger Sequencer machine was obtained by AIMS a few months ago. This technology is still considered as the Gold Standard for genetic diagnostics. Much advanced Next Generation Sequencing (NGS) technology will be introduced in the near future at AIMS. This will help in identifying specific /multiple genes, which will in turn aid in prescribing the right choice of drug. This technology is also expected to spur research output exponentially and thereby enhance the quality and the number of publications from AIMS.

Autoimmune Research

Over the past decade, Biochip technology based autoimmune diagnostics have made rapid strides. Translational research in terms of newer antibody identification and characterization with relation to hitherto

untreated diseases, is to be carried out by our research team. Biochip technology based quicker and accurate solutions are to be brought out in collaboration with global technology leaders in Germany. Research into the role of autoimmunity in diseases of the elderly, such as Parkinson's disease and cancer, has thrown up surprising possibilities, and AIMS is on par with the best in the world, such as Mayo Clinic.

Allied Health sciences

It is mandatory for all undergraduate and postgraduate Medical and Allied Health Sciences students to get involved in research activity. Required facilities for such work are provided to them. Adequate funds are also made available for their disposal. Hospital research facilities are also attached to Nanoscience Research Centre. The master's students of Hospital Administration are engaged in research activities of hospital management and other hospital administration.

Future Laboratories

Laboratories that are well-established, accredited by national and international agencies, in which advanced genomics and molecular biological laboratory work can be done, will be established. They will include automated extraction instruments, automated liquid handling consoles to avoid human errors, PCRs including digital PCR with next generation sequencing platforms, and a dedicated bioinformatics laboratory for analysis and interpretation of the data readily available and used for the immediate patient care decisions.

Advanced high-throughput equipment for pathway and immune profiling analysis will

be provided, including Nanostring counter, and advanced real-time PCR machines such as OnSite Nucleic Acid (OSNA) analysis, etc..

We will establish a proteomic laboratory with sample preparation of surgical resected samples for tumor margin identification and high-fidelity mass spectrometry facilities further assessment for completion of surgical resections.

We will also build a state-of-the art cell culture laboratory with clean-room facility for cancer cellular analysis for survival and pathogenicity and pharmacological assessment of novel targeted drugs.

Clean room facilities for cell therapy

This includes cell sorters, analysers, GMP standard clean room for pluripotent stem cell development, cell preparation automation for human diagnostic and therapeutic purposes.

Tissue Bank: Cancer tissues and cancer cells are the lead for very many deeper biological studies, and this can only be addressed by having enough tissue and samples. This requires deep freezer rooms, cold-chain facility, logistics and transport and maintenance and accreditation of tissue bank services to be fully integrated with computerized retrieval and barcoding, and automated book keeping facilities with data warehouse capabilities.

Bioinformatics Core facilities specifically for genomics laboratory. Apart from the general bioinformatics laboratory in computer science, genomic and transcriptomic bioinformatics are vastly emerging as a central medical biological tool for epidemiological and other population studies as well as individual. This requires advanced bioinformatic softwares, advanced computing

facilities and expertise.

Human Cytogenetics:

The Department of Human Cytogenetics is involved in research, academic activities and provides state-of-the-art genetic diagnostic services to the patients attending AIMS and other hospitals. The department of Human Cytogenetics was established in January 2006. The department currently performs a comprehensive list of cytogenetic studies on bone marrow - for adults, pediatric, and prenatal Cytogenetics including fluorescent in situ hybridization (FISH). The laboratory is equipped with colour imaging and computerized karyotyping system, which not only enables a broader spectrum of our services, a substantial shortening of turnaround time of the results, but also provides the consulting referring physician with higher quality of results.

The use of knowledge from genetics research to promote health and prevent disease and disability is now being explored using molecular technology. The current methods do not provide information about the benefits and risks of genetic testing, the efficacy of early interventions, and the population distribution of genotypes and other risk factors associated with disease conditions. For the next ten years we plan to introduce innovative diagnostic testing in Cytogenetics - in molecular Karyotyping, interdisciplinary research and developing as a referral center for other hospitals and health care providers.

This strategic plan focuses on human genetics and is based on the assumption that the use of genetic information in public health is appropriate in diagnosing,

treating and preventing disease, disability, and death among people who inherit specific genotypes. This plan supports the responsible use of genetic tests and services, including adequate family history assessment and genetic counseling, for promoting health and preventing disease in different communities.

Foster partnerships and coordination of genetic activities within and outside of AIMS to promote health and prevent disease and disability.

Ensure and educate patient and bystanders that ethical, legal, and social issues are addressed in applying genetics to the promotion of health and the prevention of disease and disability.

Assess how risk for disease and disability is influenced by the interaction of human genetic variation with modifiable risk factors.

Ensure that genetic tests and services are incorporated into population-based interventions that promote health and prevent disease and disability.

To develop and implement a plan for molecular diagnostic systems process improvements for Breast Cancer, Colorectal Cancer, Lung Cancer, Prostate Cancer, and Lymphoma; and other cancers and disease types. To develop and implement similar pathways and improvement processes for all high risk cancer patients regardless of disease site in order to ensure their diagnostic procedures are completed within the recommended timelines.

To introduce new molecular diagnostic tools for all types of haematological malignancies. Chromosome microarray - molecular karyotyping is an advanced whole genome investigation used to detect sub-microscopic

DNA abnormalities that are not readily detectable by conventional karyotype and/or fluorescence in-situ hybridisation (FISH). This technique can be used in the diagnostic investigation of haematological malignancies to detect loss and/or gain of DNA, and copy neutral loss of heterozygosity. This test will provide information about the genes involved in regions of copy number alteration. The information provided will assist in patient management.

Prenatal diagnosis:

To introduce molecular karyotyping in a prenatal setting. The key issues are the speed and the higher resolution with molecular compared to conventional karyotyping. The introduction of molecular karyotyping, particularly with regard to its increased resolution will help the clinicians to understand the potential to detect genetic imbalances. This will provide timely and accurate information to patient and clinicians on the promotion of health and the prevention of disease and disability.

To introduce a two year Fellowship program in Human Cytogenetics, giving intensive training in medical genetics for pathologists and other Allied Health professionals, and a proposal to start a two year program in M.Sc. Medical Genetics.

Collaboration with major research centres in India like BARC, TIFR, Indian Cancer Research Centre, Centre for Cellular and Molecular Biology, etc.. Professors and Scientists will be invited for taking classes and to speak in seminars and conferences. Personnel from AIMS will be given advance training in these major institutes in advance

research. It is proposed to collaborate with private sector research centers in India and other universities abroad.

Department of Human Cytogenetics being the one of the major leading genetic diagnostic Centre in South India, training can be imparted to scientists and other clinicians. To develop Department of Human Cytogenetics into a Centre of Excellence and pave the way for advance stem cell research.

Cellular and Molecular biology is a wide subject field currently encompassing all the clinical, pre-clinical and paraclinical subject fields. We are working towards our potential of integrating cellular molecular biological methods and tools. We are focusing on Human Molecular Genetics and Molecular Oncology.

Molecular Oncology

The cancer medicine and biology has grown exponentially and now integrated into the routine clinical practice. Status of the cancer medicine in AIMS currently is cancer genetic screening and questions asked just on the association and finding out correlation.

AIMS Cancer Institute is an excellent center where academic knowledge development and hospital services can be seamlessly integrated.

The following scientific topical advancements should be introduced in AIMS in the next five years.

Molecular signalling pathways mechanisms involved in each of the subset of cancerogenesis is needed to be studied well in the Indian population.

Cellular cancer phenotyping along with

molecular pathway analysis is the best way right now to understand cancer progression.

Cancer immunology consisting of macrophages and inflammatory infiltrates is currently being characterized heavily as newer therapeutics are being developed based on this information.

Expression analysis must become routine diagnostic parameters in the coming years as they are the direct biomarkers in the pathogenesis.

Human Molecular Genetics:

Current level of genetic screening is to be shifted to genomic level analysis for hereditary metabolic disorders. Currently, these screening tests are being outsourced. However, the data is not comprehensive enough to understand the underlying mechanisms. Many single gene disorders, on deeper exploration using next generation whole genome sequencing, are now being associated with multiple genes and pathways.

Beyond genomic level of analysis, more comprehensive exploration which includes expression analysis, epigenetic analysis to understand the basic biological changes is the need of the time. This needs to be included in the next five years.

Prenatal identification of congenital disorders needs to be revamped in terms of sample collection, processing, maternal-cell contamination free and facilitated larger and deeper level genetic screening.

Many congenital disorders which includes chromosomal level derangements with several genes needed to be understood from biological context, environmental and epidemiological context. This needs an

integrative proteomic - metabolomic analysis, which can also be initiated during the first five years and fully implemented in ten years.

Equipment/Infrastructure

The following requirements have been identified and projected for facilities establishment:

Next generation sequencing facilitating deeper level sequencing.

Equipments for expression/transcriptome analysis such as Nanostring encounter and other advanced real-time PCR including digital PCRs using advanced automated assays and methods.

Facilities for more rapid non-invasive prenatal testing (NIPT) than chronic villous sampling, or amniotic fluid sampling. This includes sample collection, preparation and readying for high-throughput analysis.

Metabolomic-Proteomic analysis requires HPLC and other clinical standard chromatography.

Advanced cell segregating systems such as cell-sorters and analyzers.

Automated hardware systems for routine nucleic acid extraction and assays.

Departmental Plans

Biochemistry and Molecular Biology departments to be strengthened to include more faculties and courses on advanced molecular biology subjects. Course curricula should include topics of post-graduate level and include skill development laboratory on advanced molecular biology techniques.

Medical and para-medical students are to be given more time to understand physiology through previous and current research work rather than learning from text books. Medical

students (UG and PG) needs more time to be spent on understanding cellular and molecular biology case studies and then have direct access to laboratory to design and do experiments to address scientific questions.

Faculty from National biotechnology institutes and/or industry should be brought in to design course work and give classes to students.

Dept of Infectious Disease and Infection Control

Vision: To have Amrita as a leader in ID and Infection Prevention in the country

International Collaboration:

Imperial College, London on Ethnography and Antibiotic Stewardship

University of Antwerp on Point Prevalence Surveillance and multi-centric Global PPS participation

University of Michigan on Antibiotic Stewardship

Global Health

Multidrug resistant Gram Negatives Bugs

International Collaboration:

University of Wisconsin on SEPIS (Systems Engineering and Program Implementation on Sepsis) 1 yr: Funded program (5)

University of Cologne on Invasive Mycosis (6) University of Melbourne on E tracking of Antibiotic stewardship

National Collaboration: (1) Collaboration of 25 hospitals on Point Prevalence Surveillance of AMR and Antibiotic Consumption (2) Collaborative of 10 hospitals in the country for PLABSI (Peripheral Line Associated Bloodstream Infections)

Projects: (1) Economic and Social Research

Council (ESRC) project of PESTELI (Political, Economic, Social, Therapeutic, Ethnography, Legal and Implementation Science): 2million Pounds projects with UK, South Africa and Rwanda (2)Welcome Trust Innovator Award application for Therapeutic Drug monitoring at Point of Care with Imperial College and Dept of Biotechnology at London School. 50L sterling project (3) Grand Challenger Research Fund (UK) project for Drug Resistance within NRF (National Research Focus) group (4) E Sepsis Registry implementation across public and private hospitals in India: ICMR (Extramural project) (5)ICMR – CDC project on Healthcare Associated Infections, Laboratory Quality Assurance, EQAS and Antibiotic Stewardship: Fully funded project by CDC (6)SEPIS project with University of Wisconsin (Antibiotic Stewardship) (7) Population kinetics of Colistin in patients with Normal Renal function: Extramural funding (8)Caripil administration in patients with Moderate to Severe thrombocytopenia secondary to dengue: Extramural funding (9)Imperial College funding for developing Animated Software on Antimicrobial Resistance for Public Education

International & National Advocacy: (1) Working with WHO and CDC in development of National Action Plan on Containment of Antimicrobial Resistance (2) Working with State Govt on development of Antibiotic Practicing Guidelines (3)Working on capacity Building of 39,000 doctors on Antibiotic Stewardship (4)Amrita has been asked to liaison with State to strengthen the Communicable diseases death analysis. (5)Capacity Building: Amrita ID team organizes Fellowship program on “Good Antibiotic Prescription program” Training for

medical professionals.

Amrita Infection Prevention team is organising 8 weeks of Distance Learning for Nursing staff on Infection Prevention. Training exclusive team of doctors and nursing staff from public and private institutions of the country

Short term Plan: (1) To formulate Antibiotic, Anti-tubercular and Antifungal guidelines and conduct surveillance on compliance to the institutional guidelines. (2) To have tissue based antibiograms prepared and develop institution specific guidelines. (3) To train all faculty and staff on Antibiotic Stewardship

Medium term Plan: (1) To develop Clinical Decision Support System (2) To develop Rapid Diagnostics (Point of Care) for Antimicrobial Resistance (3) To develop translation model of Bench to Bedside for Antimicrobial Resistance and Clinical Adherence to Guidelines

Long term Plan: (1) Online Registry of Sepsis (2) Center of Excellence of Infectious Disease in the Country (3) To become Collaborating Center for Worldwide training of all faculty on Antibiotic Stewardship (4) To establish a School of Tropical Medicine

Digital Health

Advance Health Analytics: The large amount of longitudinal health care data from Amrita Hospital Informatics & Telemedicine (US Patent 8000977);, strong research teams with health sciences, life sciences,

computational, CSE, medical imaging and Machine Learning, provide Amrita a distinct and unprecedented opportunity for interdisciplinary research in drug discovery, data-driven clinical trials, public health, personalized medicine and intelligent clinical decision support systems. Interdisciplinary teams from Medicine, Public Health, Engineering and Data Science will work together for improved research and publications. Deployment has happened of at least 100 wearable wireless systems for remote patient monitoring and integration of mobile hospital information system with Amrita Hospital Information System at Amrita School of Medicine.

Computational drug design,

harmacogenomics, Pharmaco-informatics, and algorithms to find genotype-phenotype based in classification of clinical data for diseases.

Molecular based Clinical Decision Support Systems will be expanded from identifying the right combination drugs for breast cancer to all cancers and to other diseases while minimizing SNP tests. We will create intelligent platforms for integrating medical literature, clinical information, image analysis, patient data, and molecular diagnostics with therapeutic algorithms.

Personalized Health Monitoring System: AmritaJeevanam (patent pending), an intelligent system designed to assist rural health workers with differential diagnosis and personalized feedback will be extended for oncology, maternity, elder care and integrative medicine.

Ayurveda

The Amrita Centre for Advanced Research

in Ayurveda has set up Amrita Sparsham – Integrative Cancer Clinic to bring the benefits of Ayurveda for improving the quality of life of Cancer patients. This clinic aims to offer better care in cancer prevention and management through an integrative approach by collaboration of Ayurvedic physicians and Allopathic doctors.

In August 2017, an International Conference on Integrative Medicine was conducted in collaboration with Amrita Institute of Medical Sciences, Kochi which brought together about 1000 delegates and more than sixty experts from the field of modern Medicine and Ayurveda together on a common platform. The goal of the conference was to explore ways and means to integrate Ayurveda and Modern Medicine for better management of selected diseases.

Steps have been taken to establish Society of Integrative Medicine in India to bring together practitioners of different medical systems and also to address health issues of social importance that can be addressed by Integrative Approaches. The institution is always striving to achieve social impact by conducting health camps, surveys, adaptation of few villages to make them disease free.

Engineering

Amrita has identified indigenous manufacturing of healthcare equipment as a major need for our country. Class I and Class II equipments which require less regulatory control includes equipments that fall into the following four classes: consumables and implants; instruments and appliances; diagnostic imaging and patient aids including prosthetics and orthotics and pacemakers. As an example, Amrita Institute of Medical Sciences, the multispecialty

hospital of Amrita in Kochi campus, alone spends about Rs. 10 crores a year to import a variety of class I and II medical equipments. Nationwide this is estimated to be a staggering Rs. 100,000 crores a year, a huge loss for the Indian economy. This is consistent with the Government of India study result shown below. The study result published below was for the purpose of attracting foreign investments to India. However we wish to emphasize lower cost indigenous manufacturing research that will lower the cost for patients, particularly since imported equipments are highly overpriced. Even if India invests for manufacturing research only one percent of total market size of about Rs. 100,000 crores, namely, Rs. 1000 crores a year, to develop many of these equipments indigenously, India could be self sustainable in the small medical equipment sector and could even compete in the international market by exporting affordable class I and II equipments. Amrita intends to put a major emphasis on manufacturing research of small medical equipments and devices and leading consortia in this critical area. Given Amrita's strength in electronics, mechanical engineering, biotechnology, nanotechnology, sensors, materials, computer science and engineering, Amrita is well poised to expand a thrust in manufacturing with a special focus on healthcare.

A second major area of manufacturing for the healthcare sector is new drugs, particularly drugs with less side effects and drugs that have improved efficacy by controlling their delivery and targeting. The Nanotechnology Centre at Kochi is already well positioned to make a major impact in this area with the setting up of GMP manufacturing facilities for its new

nanomedicines. The Biotechnology centre is developing new medicines from natural products and the Ayurvedic research Centre is developing new medicines from ayurvedic herbs. The Indian Nanomedicine market potential is huge - an annual Rs. 50,000 crore, almost all of which are sought to be grabbed by foreign companies such as Abbott, Johnson and Johnson, Pfizer etc.. The market potential for natural medicinal products is about Rs. 20,000 crore and India is only producing 10% of its market potential with foreign investors eyeing this potential in the coming years. Again it is expected that these companies will provide such products at extraordinarily high cost to patients. There is again a huge need to develop strong manufacturing capability in advanced but low cost new drugs to meet this demand. Amrita will have a major thrust in nanotechnology-based products, both drugs and new implants designed to last much longer and is affordable. Also Amrita seeks to drive research in medicines from natural and herbal products.

Amrita's strength in electronics, mechanical engineering, biotechnology, nanotechnology, sensors, materials, computer science and engineering will be applied to Smart Manufacturing & Hardware Systems research, aligned with the Make in India programme. Amrita has expertise and will expand the current thrust in manufacturing to Sensors, IoT devices, Materials for Defense, Robotics & Automation.

Photonics and Manufacturing

Light based technologies, though not new, is still a new wave of the future. First focus will be on developing reliable, cost effective

but high fidelity lasers of various stable wavelengths. Initial work will be on laser high precision machining on very hard to machine materials, such as polymers or composites, or highly brittle materials. Another effort will be on developing advanced two-way laser communication systems of high fidelity and high-speed data transmission using nanotechnology based detector arrays.

Manufacturing Research Centre (MRC)

(i) One of the highlights of the MRC is a Good Manufacturing Practice (GMP) clean room facility for the manufacturing of nanoscale materials and products for medical applications. This will include labs for nanofiber products, nanoparticulate materials including core-shell nanoparticles, drug encapsulated nanomaterials labs; special labs for chemo drug processing with nanomaterials for oncological applications; nano textile processing labs; nanocomposite labs for manufacturing of porous and flexible scaffolds; gel and gel composite and drug encapsulated gel labs; labs for production of surface functionalized nanomaterials for chemical or biological targeting; lab for production of contrast enabled nanomaterials. This will be the first such GMP lab in the academic sector in India. GMP Lab construction has begun. The following Labs will constitute the Centre.

Nanoscale and Microscale thin film manufacturing labs. This will include facilities for multilayered thin film deposition using multichamber integrated automated vacuum deposition system using different deposition modalities, such as, sublimation, and sputtering. It will also include labs for

spray pyrolysis deposition of microscale films, electrophoretic deposition, spin coating, electrospinning deposition of nanofibrous thin films and chemical vapor deposition (CVD). Some of the other labs are: lab for gas phase manufacturing of composite or alloy nanoparticles, casting lab, extrusion and molding lab, CNC machining and micromachining lab, metrology lab for measurement of surface roughness, part shape and size at nano and microscale levels, surface finishing lab (grinding and polishing), laser-based manufacturing lab and microelectronic fabrication lab.

Advanced functional materials and composites:

Many affordable materials can be developed that have advanced functionalities, yet are cost effective using new composites or new production methods. These will be developed in this thrust area. Some of these advanced materials will be made using nanomaterials as a component to provide additional functionality. One of the themes will be to avoid rare, expensive or toxic materials such as cadmium and take a greener route to producing these materials. Another emphasis will be on advanced catalysts, such as catalysts using safe or green quantum dots with unique properties.

A Center for Advanced Composites and Structures is being set up. It has designed lightweight bullet proof materials and blast proof materials to support the defence needs of the country. In the next five years, research and development will include light weight foamed composites for radiation and temperature resistant packaging application. Development of high radiation resistant composites for aviation, space and nuclear

application will also be a priority.

Manufacturing, Robotics and Automation:

Plans are under way for functional low cost robots. This includes, agricultural robots, patient care robots, rehab robots and additional robotic design for vocational training. Agri robots are planned for increasing crop yields such as rice transplanter, rice dehusking, soil testing and so on. Patient care robots can be used for helping rehabilitating patients after serious illness to help with simple tasks. Rehab robots are helpful for physical medicine and rehabilitation to help patients who may have suffered stroke or accidents.

Manufacturing and Sustainable Transportation:

The main effort here will be to work on emission reduction, engine performance improvement and improvement in engine design. While laser surface texturing has been studied to improve gas flow, nanotexturing will be studied as a new option. Novel catalysts will be studied to reduce noxious emissions and for low temperature emissions. New materials for superchargers will be investigated for improving engine performance.

Sustainability

Sustainability is a multidisciplinary research initiative with ecology, engineering and economics focussing on tackling global issues in areas such as Clean Water,

Clean Water:

Nano-based electrospun materials will be explored for clean water. Gates foundation

grant has been received for a microbial sanitation system. This will be developed and extended to prototype application and eventual larger scale use. Inaccessibility to water resources and water scarcity is another major problem faced by rural communities. We have developed water distribution networks integrated with IoT system for monitoring, control, and management of networked water resources and manage the usage of the available water resources based on its recharge capability, the current water quality level and the real-time demand response mechanisms. This system has been deployed in seven rural areas. We also work on assessment of water quality levels, building water purification systems, developing filters for emerging pollutants such as pesticides and medicinal impacts.

Research studies of water contamination levels and water borne diseases in collaboration with our Center for Wireless Networks and Applications, School of Medicine, and Department of Social Work

Energy:

Energy is a major component of sustainable living and efficient energy generation and storage is very critical for this. Of particular relevance is alternative energy. Existing studies at Amrita will be extended to new thin film solar generators using such materials as CdTe which is less toxic than Si. Hybrid quantum dot solar cells are also planned. On the storage side research is planned for further development of Li ion batteries with innovative cathodes and anodes for improved energy storage and power density. Also planned in the research is solid state batteries and batteries using higher capacity Na and Mg ions. On the energy delivery side hybrid microgrids and

smart microgrids will be developed using some of the newer cells developed at Amrita and also integrating the same with Amrita developed storage systems. Designing of solar powered charging stations will be studied. We have deployed India's first campus level smart grid network for real-time monitoring, control and management of the network. This network also aids as teaching aid to simulate the different faults and analyze the behavioral changes. Solar microgrids with real-time monitoring, control and energy exchange has been devised in real-world tribal community. Heterogeneous energy sources such as energy from kerala Electricity Board, solar and micro hydro has been integrated in one of the tribal village to provide optimized, affordable rural electrification for the tribal villages. This field deployment also provides an opportunity for faculty and students to perform their experiments and learn the real-time changes in the energy scenario with respect to climatic changes.

Hydrogen Storage:

Hydrogen storage promises to be a major player for energy storage in the future. The limitation is the storage density and release kinetics. Amrita university is pioneering a hydrogen storage systems using alloy nanoparticles which has potential to be superior to conventional systems. This system will be further developed by setting up a new manufacturing system for controlled dispersion of alloy nanoparticles and then tested for stability, reproducibility, and minimum size scatter and then the system will be studied at different temperatures and pressures for applications in hydrogen storage.

Resilient Communities

Lifesaving Technologies for Extreme Environments

Landslide early warning system: (US patent 8692668) World's first real-time wireless sensor network system for continuous monitoring and real-time early warning of landslides at Western Ghats and Himalayas. This system successfully issued several warnings of imminent landslides. Deployment of Wireless Sensor Network Systems for Landslide Monitoring and Early Warning in Landslide Prone Deployment of Wireless Sensor Network Systems for Landslide Monitoring and Early Warning in Landslide Prone Areas in Himalayas and Western Ghats through the existing research fund from Ministry of Earth Science (MoES) and Department of Science and Technology (DST) and future funds expected from UNESCO. Areas in Himalayas and Western Ghats through the existing research fund from Ministry of Earth Science (MoES) and Department of Science and Technology (DST) and future funds expected from UNESCO. Enhancement of existing collaborative research project LANDSLIP (NERC (UK) funded project) through its research partners such as Indian Meteorological Department (IMD), Geological Survey of India (GSI), British Geological Survey (BGS), Met Office UK, CNR Italy. Existing MoU with Politecnico di Milano, Italy in developing collaborations on Numerical Simulation of Landslides. Enhancing the research into other areas such as avalanche monitoring, drought monitoring, flood monitoring etc.. Development of regional warnings for rainfall induced landslides. Enhancing the current research performed as part of the joint Indo-German research project

FloodEVAC in monitoring, early warning and disaster management during floods.

Amrita OceanNet: Extended offshore communication range for fishing vessels using heterogeneous wireless network, novel antenna design, and unique opportunistic network protocols. Several sea trials show that the communication range has been extended 3X.

Climate Change & Disaster Management

A new Center for Climate Change and Disaster Management has been initiated: Deployment of Wireless Sensor Network Systems for Landslide Monitoring and Early Warning in Landslide Prone Areas in Himalayas and Western Ghats through the existing research fund from Ministry of Earth Science (MoES) and Department of Science and Technology (DST) and future funds expected from UNESCO. Developing models on 4G on slope stability (geology, geometry, hydrogeology and geotechnical) Installation of atmospheric data observation systems in selected locations. Atmospheric and ocean data sensors on-board Micro-net platforms and Modeling & Simulation of Meteorological Data.

Multi hazard monitoring, detection and early warning is one of the thrust areas of our research. The current systems deployed for landslide, flood etc., will enhance the accuracy and fidelity of the detection system using additional sensors and the system will be tested for improved detection capability. For handling the critical and emergency situation in the ocean, and for effective disaster management, the communication range of the OceanNet technology for long

range wireless internet will be extended to beyond 100 km into the ocean. Wireless technology for healthcare will be studied to wirelessly detect signals from inside the body for health monitoring. Non invasive health parameter detection techniques will be developed for several diseases. Deep learning concepts and big data applications are integrated to detect and pre warn several medical ailments. Research in this direction is showing very good results. Several wearable and portable patient monitoring systems are developed and deployed in either the hospitals or in the rural communities.

Cybersecurity:

Merging both physical system security with cybersecurity, we will focus on both Infrastructure and Information security. In order to combat various socio-technical, behavioral and organizational challenge, the study and development of smart solutions towards secure information sharing, predictive models of networked systems, social engineering and computing, design of test beds for various cyber physical systems for protection of critical structure will be the major milestones in immediate five years. With a broad spectrum of security-focused activities, our goal will be to develop globally applicable best practices and solutions as key outcomes of our research. Today India relies significantly on foreign made software and hardware products for its security solutions. This in itself poses a significant threat to the country. Partnering with Government and other key nodal agencies, we will develop indigenous products so as ensure no external influence on national security. Faster computing along with miniaturization of devices will require optimization of protocols and algorithms towards maximising the

power of quantum and quark computing in protection of networks using secure protocols and techniques against multi-pronged attacks.

The interplay of power and security is one of the foremost concerns ranging from tiny embedded devices to powerful datacenters due to increasing functionality of applications coupled with limited amount of available resources. Thus, there exists a need for management of resources towards facilitating energy usage. Towards this goal, we focus on developing accurate energy models to account for the impact of factors affecting power consumption. This can be further used to develop energy efficient applications and protocols by considering the needs of the environments. Development of scalable block chain like technology for IoT security.

Pedagogy & Learning Technologies

Expand integrative medicine trials, introduce alternative technologies for medical diagnostics

Digital Education

Pedagogy & Learning Technology

Amrita has a leadership position in Digital Education, building pedagogically sound and award-winning technologies enhanced learning solutions in Skill Development using haptics and HCI, School Education with Adaptive Learning, Simulation and Game based learning with OLABs, Virtual Labs, MedSIM, Distant Learning technologies, Immersive Learning environments. Our research will be at the intersection of Pedagogy, Neuroscience, Clinical Psychology and Engineering, with Assistive and Personalised technologies for different learning disabilities such as dyslexia, hearing impaired and autism. Research into

Student and Item Modeling for Personalized Learning environments.

Advance Personalized Learning

We will incorporate AI based spoken communication in Amrita Learning App, which is a semifinalist in the \$7 million Barbara Bush Foundation XPRIZE competition. Current data from learners are being analysed to make data driven decisions in improving learner motivation and outcome to help large-scale adoption in the US. In the future, the AI and NLP systems will be expanded to support multiple Indian languages.

Advance Simulation based Learning

Simulation based systems will be expanded to all aspects of learning and enhanced. Simulation enhanced nursing simulations will support Nursing Specialization. Future MedSIM to be enhanced using Holography for medical education and Virtual Reality for Science Learning.

Advance Assistive technologies for Learning Challenged based on Cognitive Science

Early identification & Assistive technologies for Learning Challenged, such as Dyslexia & technologies to assist speech for hearing impaired will be designed and deployed.

eGovernance Big Data Analytics Platform (eGAP) is being rolled out to schools, followed by different districts/states.

Learning Analytics & Predictive Models will be incorporated.

Amrita Big Data Framework(ABDF) an integrated framework for Big Data analytics

Data Science & Analytics: UN SDG, Digital India, Rural Development: The large amount of data from India's eGovernance initiatives & Amrita's initiatives in Energy, Climate Change, Health Devices, Learning Analytics, Education, Skill Development, Women Empowerment, will be analysed for impact and policy.

Digital Government:

An interdisciplinary Centre for digital government and knowledge societies is planned to contribute to enhancing India's E-Governance Development Index (EGDI) ranking from 'Medium' to 'High' in the next 5 years, and from there to the top bracket 'Very High' by 2030; coinciding with the Sustainable Development Goals (SDG) timeframe. The main objective of the Center would be to create and establish fruitful co-operation between the academia, public administration, industry and civil society for diffusion and adoption of Digital India initiatives.

AMMACHI Labs

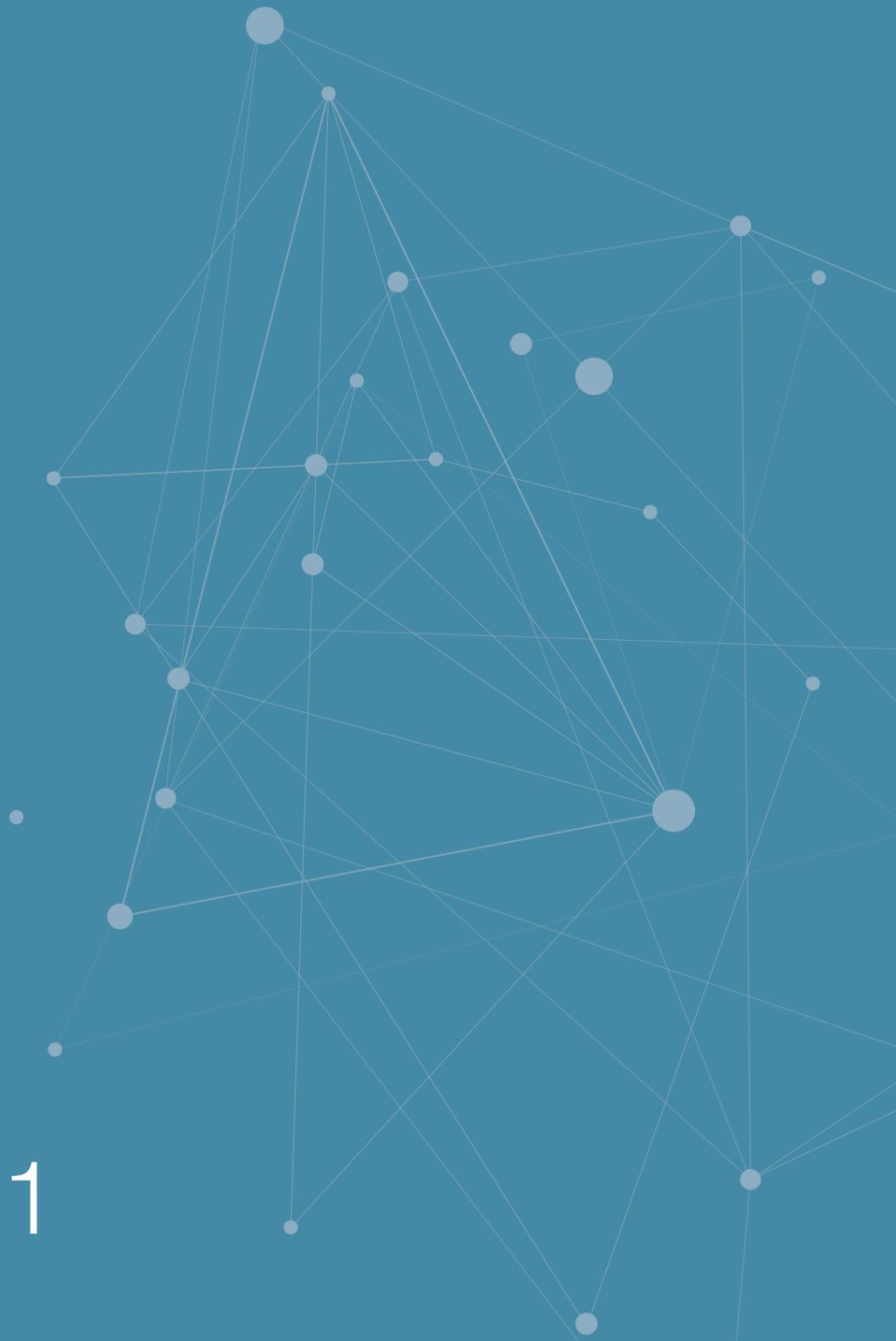
AMMACHI Labs is an academic and research center at Amrita University that brings an interdisciplinary approach to addressing societal challenges. The lab creates innovative vocational educational tools and skill development solutions to help uplift entire communities. In the lab's commitment to rural villages of India – the very communities that stand to benefit the most from skill development – the lab members are as excited about the continuing development of community outreach solutions as about our focused R&D for CHI, automation, haptic technologies and applied robotics.



Here is the plan indicating the research labs and facilities that are proposed to be established. Research plan is below.

	Year 1	Year 2	Year 3
Faculty of Medicine Labs	Microbiology Lab	Genomic Lab	Biorepository Lab
	Molecular Biology Lab	Protein Purification Lab	Cell Expression facility
	Bioinformatics Lab	Protein Coating Lab	Wound Healing Lab
	Biochemistry Lab	Cancer Biology Lab	Phytochemistry Lab
	Analytical Chemistry and Venomics Lab	Neurophysiology Lab	HPLC Labs
	Drug Delivery Systems Lab	Animal Imaging Lab	Computational Neuroscience Labs
	Tissue Engineering Labs	Phytochemistry Lab	GLP Animal Labs
Faculty of Engineering Labs	GMP Lab	Gel and Gel composite Lab	Gas Phase Manufacturing Lab
	Nanotextile Lab	Surface Functionalized Materials Labs	Extrusion and Molding Lab
	Nanocomposite Lab	Thin Film Lab	Laser Manufacturing Lab
	Advanced Composites and Structures Lab	CNC Machining and Micromachining Lab	Thin Film Lab
	Robotics Lab	Radio Frequency Lab	Energy Systems Lab
	Landslide Laboratory and Climate Change Lab	High Performance Computing Lab	Shock Wave and Hypersonic Lab
	Wireless sensor Networks Lab	Wearable Wireless Systems Lab	Remote Sensing and Monitoring Lab
	Security for Embedded Networked systems Lab	Powertrain Technology Lab	Sensor development
	Computer Hardware and Systems Control Lab	Hardware and software data storage, security & analysis	Image & signal processing
	Advanced Automation	IoT Research	Hospital Information Systems Research Lab
	Advanced Manufacturing and micro machining research	High performance composite materials	Skill Development Haptics Lab
	Advanced Simulation Lab	Assistive Technologies Lab	IoT systems Lab
	Health Analytics Lab	E Learning Research Lab	Management of quality in smart manufacturing
	Computational Drug Design Lab	Virtual and O Lab Development Lab	
	Cyber Security Lab	Image Analysis Lab	

Year 4	Year 5	Year 6 - 10	Year 11 - 15
Organ Printing Lab	Antibody Lab	Application and Functional Testing	Scale up and Societal Translation
Alternative Technologies for Health Lab	Cell Culture Labs		
RNAi Lab			
Casting Lab	Microelectronics Fab Lab	Application and Functional Testing	Scale up and Societal Translation
Surface Finishing Lab	Metrology Lab	Application and Functional Testing	Scale up and Societal Translation
Microwave processing Lab	Surface Texturing Lab	Application and Functional Testing	Scale up and Societal Translation
Controls Laboratory	Irrigation Systems Lab	Cyber-physical systems Lab	Scale up and Societal Translation
Water Systems Lab	Artificial Intelligence and Robotics Lab	Application and Functional Testing	
Telemedicine Research Lab	Haptics, mechatronics and robotics research	Rapid prototyping, tooling, embedded systems design	
Emissions Lab			
Integrated Energy Storage and Generation Lab			



PART 1

V.

Proposed five years
implementation plan

Part 1. V

- a. To mention the detailed and tangible action plan, milestones, and timelines by which it seeks to achieve each of the parameters laid down in Regulation 4.2 & 4.3, mentioning milestones to be achieved in first five years and over 15 years.
- b. Timeline to achieve the expectations for each of the parameters (as given in Regulation 4.2 & 4.3) as proposed in the fifteen year strategic plan.

4.2 While an Institution declared as an Institution of Eminence Deemed to be University is free to choose its path to become an institution of global repute, an indicative list of parameters, the institute should satisfy within a reasonable time from the date of notification declaring it as an Institution of Eminence Deemed to be University are as follows:

4.2.1 It should preferably be multi-disciplinary or inter-disciplinary and have both teaching and research focus of an exceptionally high quality. Currently, Amrita is both multi-disciplinary and inter-disciplinary in nature.

Currently, Amrita is both multi-disciplinary and inter-disciplinary in nature.

Amrita has the following disciplines up and running and each focusing on both teaching and research of exceptional high quality.

School of Engineering

- Ph. D. in Engineering
- M. Tech (Master of Technology) in Automotive Engineering, Bio-Medical Engineering, Communication Engineering & Signal Processing, Computer Science & Engineering, Computer Science & Engineering- Data Science, Embedded Systems, Power Electronics, VLSI Design, Wireless Networks & Applications, Control & Instrumentation Engineering, Communication Engineering & Signal Processing, Computational Engineering & Networking, Control & Instrumentation Engineering, Cyber Security, Embedded Systems, Engineering Design, Manufacturing Engineering, Materials Science & Engineering,

Power Electronics, Remote Sensing & Wireless Sensor Network, Renewable Energy Technologies, Structural & Construction Engineering, VLSI Design Wireless Networks and

4563^{SCOPUS}
Indexed Publications

29^{Masters}

Distributed Systems (VU, Netherlands), Cyber Security Systems & Network, Power & Energy Engineering, Robotics & Automation, Thermal & Fluids Engineering, Thermal Science & Energy Systems

- . B. Tech. (Bachelor of Technology) in Aerospace Engineering, Chemical Engineering, Civil Engineering, Computer Science and Engineering, (Honours) Program in Computer Science and Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Mechanical Engineering

School of Business

- . Ph. D. in Management
- . M.B.A - Master of Business Administration
- . MBA/MS in Management with University at Buffalo, USA

191 SCOPUS
Indexed Publications

- . MBA in Innovation & PG Diploma in Sustainable Development
- . EMBA - MS in Management with University at Buffalo, USA

School of Arts and Science

- . Ph. D. in Humanities and Social Sciences, Sciences, Computer Science and IT, Commerce and Management, English and Languages, Visual Media and Communication
- . M. Phil. (Master of Philosophy) in Chemistry, Commerce and Management, English, Visual Media
- . Integrated M. Sc. (Master of Science) Chemistry, Mathematics, Physics
- . Integrated M. A. (Master of Arts) English Language and Literature, English Language and Literature
- . Integrated B.C.A / M.C.A (Bachelor of Computer Applications) / (Master of Computer Applications)

- . M. Sc. (Master of Science) in Chemistry, Mathematics, Physics, Computer Science
- . MCA - Master of Computer Applications, Lateral Entry

271 SCOPUS
Indexed Publications

15 Masters

- . M. Com. (Master of Commerce), in Finance and System
- . M. A. (Master of Arts) in English Language and Literature, Communication, English Literature & Literary Theory
- . M.J.M.C - Master of Journalism and Mass Communication
- . M. F. A. (Master of Fine Arts) in Visual Media: Animation and Content Management, Visual Media: Applied Art and Advertising, Visual Media: Digital Film Making
- . B. B. A. (Bachelor of Business Administration)
- . B. B. M. (Bachelor of Business Management)
- . B. Com. (Bachelor of Commerce), IT and Finance, Taxation and Finance
- . B. Sc. (Bachelor of Science) Visual Media
- . B. A. (Bachelor of Arts) English Language and Literature, Mass Communication

School of Education

- . B. Ed. (Bachelor of Education)

School of Biotechnology

- Ph. D. in Biotechnology, Computational Neuroscience
- M. Sc. (Master of Science) in Bioinformatics, Biotechnology, Microbiology, Biotechnology

271 SCOPUS
Indexed Publications

- B. Sc. (Bachelor of Science) in Biotechnology, Microbiology

School of Medicine

- M. B. B. S. (Bachelor of Medicine and Bachelor of Surgery)
- D. M. in Cardiac Anesthesia, Cardiology, Endocrinology, Gastroenterology, Medical Oncology, Nephrology, Neurology, Pediatric Cardiology, Pulmonary Medicine
- M. D. in General Medicine, Dermatology, Venereology & Leprosy, Anaesthesiology, Anatomy, Biochemistry, Community Medicine, Emergency Medicine, Forensic Medicine, Geriatrics, Microbiology, Nuclear Medicine, Paediatrics, Pathology, Physical Medicine & Rehabilitation, Psychiatry, Physiology, Radiodiagnosis, Radiotherapy, Respiratory Medicine
- M. Ch. in Cardiovascular & Thoracic Surgery, Gastrointestinal Surgery, Head & Neck Surgery, Neurosurgery, Pediatric Surgery, Plastic Surgery, Urology
- P. G. Diploma in Child Health (D. C. H.), Clinical Pathology (D. C. P.), Dermatology Venereology & Leprosy (D. D. V. L.), Medical Radio Diagnosis (D. M. R. O.), Medical Radiological Sciences, Obstetrics & Gynaecology (D. G. O.), Ophthalmology (D. O.), Otorhinolaryngology (D. L. O.), Physical Medicine and Rehabilitation (D. P. M. R.), Radiotherapy (D. M. R. T.), Psychological Medicine (D. P. M.)
- M. Phil. (Master of Philosophy) in

Hospital Administration, Clinical Psychology

- M. S. in General Surgery, Obstetrics & Gynaecology, Ophthalmology, Orthopaedics, Otorhinolaryngology
- M. Sc. in Biostatistics, Clinical Research, Medical Laboratory Technology, Neuro Electro Physiology, Respiratory Therapy, Swallowing Disorders and Therapy, Clinical Nutrition and Food Science
- M.H.A - Master of Hospital Administration
- M.P.H - Master of Public Health
- B. Sc. (Bachelor of Science) Anaesthesia Technology

14 BACHELORS

20 MD

14 MASTERS

1699 SCOPUS
Indexed Publications

- B. Sc. (Bachelor of Science) Cardiac Perfusion Technology (CPT), Cardiovascular Technology (CVT), Diabetes Sciences, Dialysis Therapy, Echocardiography Technology, Emergency Medical Technology, Medical Radiologic Technology, Optometry, Respiratory Therapy, Medical Laboratory Technology (MLT), Neuro Electro Physiology, Physician Assistant
- Bachelor of Audiology and Speech Language Pathology

School of Pharmacy

- Ph. D. in Pharmaceutical Sciences
- Pharm. D. (Doctor of Pharmacy)

276 SCOPUS
Indexed Publications

- M. Pharm. Pharmaceutical Chemistry,

Pharmaceutics, Pharmacology, Pharmacy Practice

- . Pharm. D. Post Baccalaureate
- . B. Pharm. (Bachelor of Pharmacy)
- . D. M. in Pediatric Cardiology, Pulmonary Medicine

School of Dentistry

- . M. D. S. (Master of Dental Surgery) in Conservative Dentistry & Endodontics, Oral & Maxillofacial Surgery, Oral Medicine & Radiology,

99 SCOPUS
Indexed Publications

Oral Pathology & Microbiology, Orthodontics & Dentofacial Orthopaedics, Pedodontics & Preventive Dentistry, Prosthodontics and Crown & Bridge, Public Health Dentistry

106 SCOPUS
Indexed Publications

- . B. D. S. (Bachelor of Dental Surgery)
- . Diploma in Dental Mechanics

School of Nursing

- . M. Sc. (Master of Science) in Nursing
- . Post Basic B. Sc. (Bachelor of Science) Nursing

9 SCOPUS
Indexed Publications

10 Masters

- . B. Sc. (Bachelor of Science) in Nursing

School of Ayurveda

- . B. A. M. S. (Bachelor of Ayurveda
- . B. A. M. S. (Bachelor of Ayurveda Medi-

cine & Surgery)

- . M. D. in Ayurveda Samhita, Dravyaguna Vigyana, Kayachikitsa, Panchakarma, Rasashastra & Bhaishajya Kalpana, Rasashastra & Bhaishajya Kalpana, Swasthavritta
- . M. S. in Prasuti Tantra and Streeroga, Shalya Tantra (Samanya), Shalaky Tantra (Netra Roga Vigyana)

Center for Nano Sciences

- . Ph. D. in Nano Medical Sciences
- . M. Tech. in Molecular Medicine,

488 SCOPUS
Indexed Publications

Nanomaterials, Nanomedical Sciences, Nanotechnology & Renewable Energy

International Centre for Spiritual Studies

- . Ph. D. in Philosophy
- . M. A. Philosophy

Nano-Bio-Medicine

Interdisciplinary Research

Year 4

- Regulatory toxicology
- Biologics
- Cancer Immunology
- Biomechanical research for muscular, skeletal and tissue systems
- Protein & RNA Engineering

Year 5

- Lab-on-a-chip development and research

Year 3

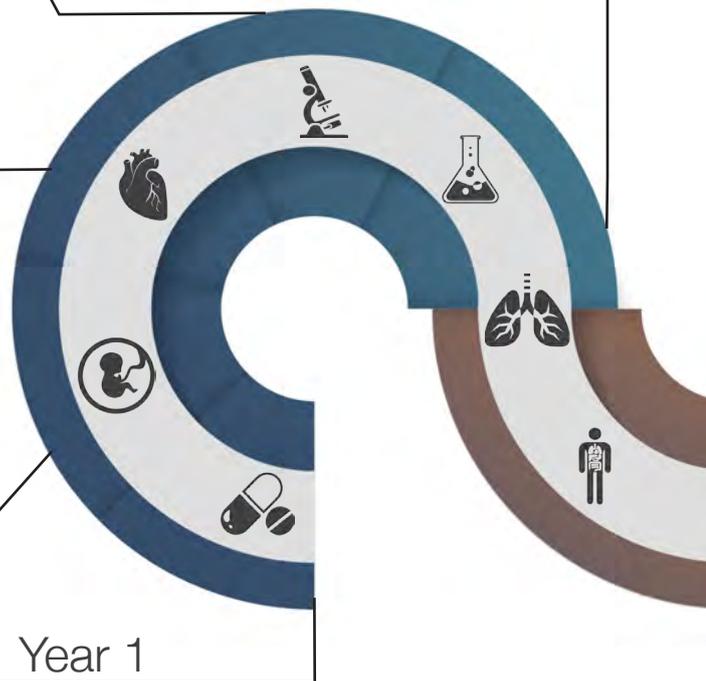
- Pre-clinical trials
- Organ regeneration
- Biomarker discover vaccines
- Cancer Chemoresistance

Year 2

- Stem cell engineering for tissues
- Gel engineering for Drug delivery
- Nanomedicines, Neurobiotechnology
- Antimicrobial Resistance

Year 1

- Wafer Engineering for Drug Delivery
- Tissue engineering for nano scaffolds
- Raman diagnostics with nanoscale surfaces
- Affordable Bio medical equipment design (Give names)



Nanoscience



Biotechnology

Medicine

Years 11-15

- Clinical Translation
- Industrial Translation
- Tech Transformation
- Affordable Bio medical equipment design (Give names)

Years 6-10

- Scale-up of Nanobio Pharmaceuticals
- Multicentric trials
- Application to Neurodegenerative diseases and cancer
- Application to Bone Tissues
- Application to Organ Regeneration
- Affordable Bio medical equipment design (Give names)

Digital Health

Interdisciplinary Research

Year 4

- Computational Neuroscience & Neurophysiology
- Medical Imaging based Diagnostics
- Personalized Health Monitoring Mechanisms Research

Year 5

- Intelligent Health Monitoring for Integrative Medicine
- Wearable for critical cardiovascular, respiratory, diabetes patients
- Bio Robotics, Biomedicine technology development
- Translation of biomarkers into wireless parameters

Year 3

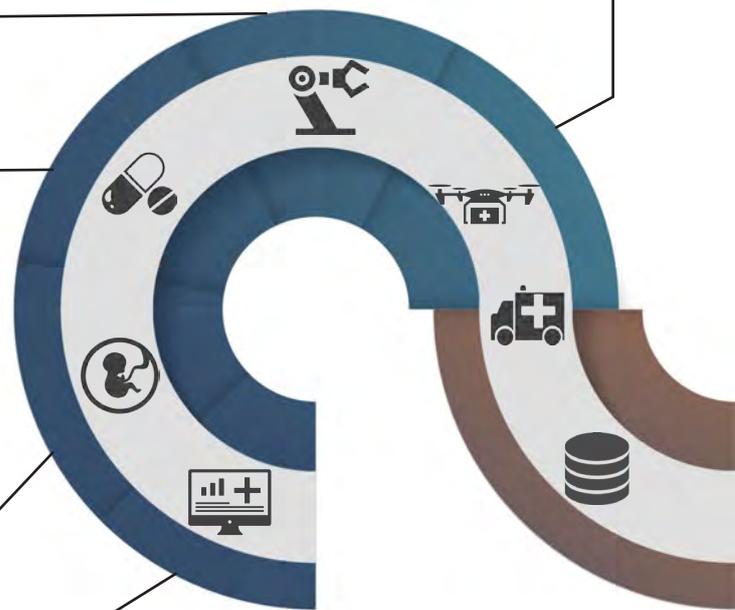
- Context-Aware Disease Modelling
- Molecular based Clinical Decision Support Systems
- BioInformatics & Systems Biology Research
- Hybrid cloud for Health IoT and informatics

Year 2

- Computational Genomics
- Intelligent Health Monitoring & Management
- Medical Imaging & Computer Vision based Research
- Pharmacogenomics Precision Medicine for Neuro Degenrative disorders

Year 1

- Health Analytics with EHR data
- EHR & Health Information Systems
- Low cost sensor systems & body monitoring devices
- Computational Drug Design



Data Sciences



Technology

Medicine

Years 11-15

- Predictive Health Demographics
- Comprehensive & Secure Digital Health Platform
- Deep Learning Smart Health Systems
- Bio-printed organ transplants
- High Performance Medical Modeling & Simulations

Years 6 -10

- Realtime remote patient monitoring
- Intelligent Health Systems
- Health Situational Awareness & Visualization
- Decision Models & Validation - Regulatory Compliance
- GPU based compute data center design

Integrative Medicine

Interdisciplinary Research

Year 4

- Pathological studies integrating Ayurveda and Allopathy
- Mapping affinity of natural Biomaterials to organs
- Stimuli-responsive Biomaterials design
- Organic Bio-substances for personalized medications

Year 5

- Drug delivery mechanisms for integrative pharmacology
- Monitoring Ayurvedic parameters for preventive medicine
- Comparative studies of disease pathways in Ayurveda and Allopathy
- Advanced pulse analysis techniques

Year 3

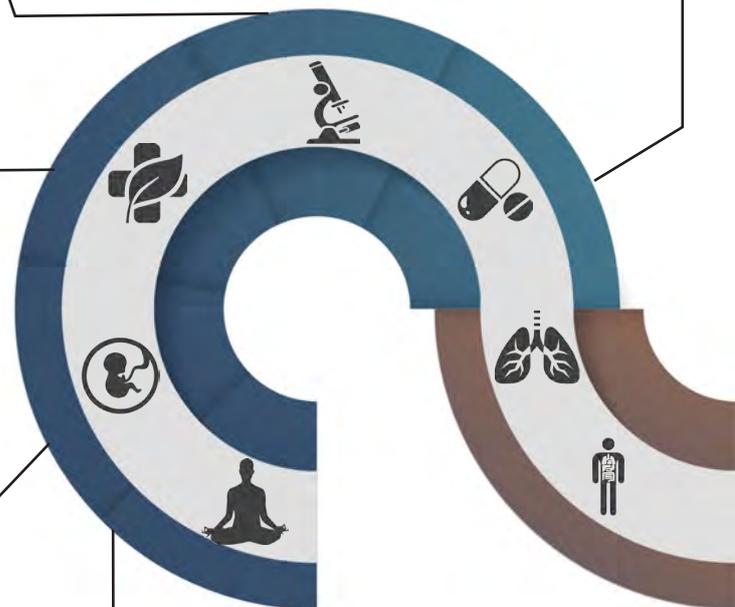
- Ayurvedic interventions for detoxification
- Personalization in pharmaceutical formulations
- Materials for Tissue integration
- RNA-Therapeutic studies for natural Biomaterials

Year 2

- Protein biology and synthesis in *Bos Taurus Indicus*
- Non-invasive Wireless methods for Prakrithi classification
- SVAROP studies on Bio-pesticides, Bio-health & Soil-rejuvenation
- Reverse Pharmacological Techniques

Year 1

- Spectrography of organic herbs
- Nano Materials in natural products
- Yoga and mediation for health
- Medications to minimize side effects

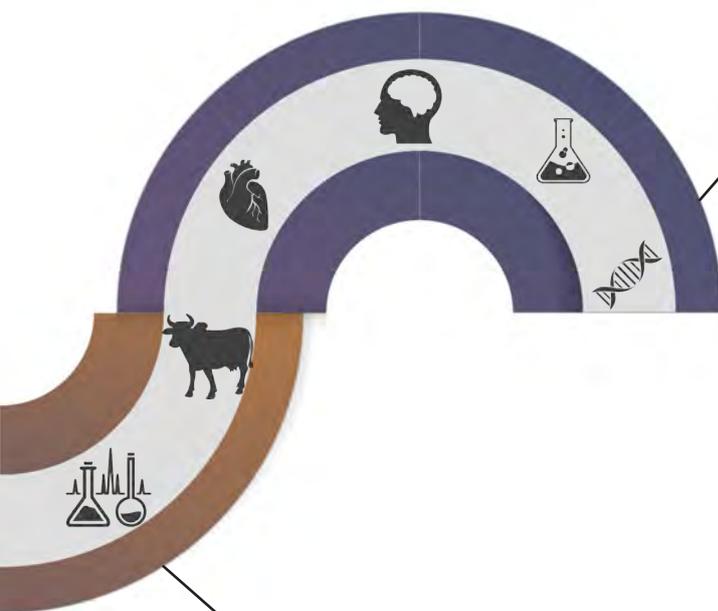


Modern Medicine



Pharmaceuticals

Traditional Medicine



Years 11-15

- Integrative approaches to lifestyle diseases including Neuro-degenerative conditions
- Continuous monitoring and personalized preventive medicine
- Low cost remote Integrative medical centers
- Phase 2 - Integrative medical trials in HIV/AIDS and Oncology

Years 6 -10

- Organic farming for natural herbs
- Natural biofluids, and biomaterials leveraging Bos Taurus Indicus
- Integrative medical trials in HIV/AIDS and Oncology
- Protocols for prognostics in Personalized healthcare

Smart Manufacturing & Hardware Systems

Interdisciplinary Research

Year 4

- Innovation in Extended enterprise manufacturing functions
- Rapid prototyping, tooling, embedded systems design

Year 5

- Devices and machines for elderly and disabled
- Integrated machine development for physically challenged

Year 3

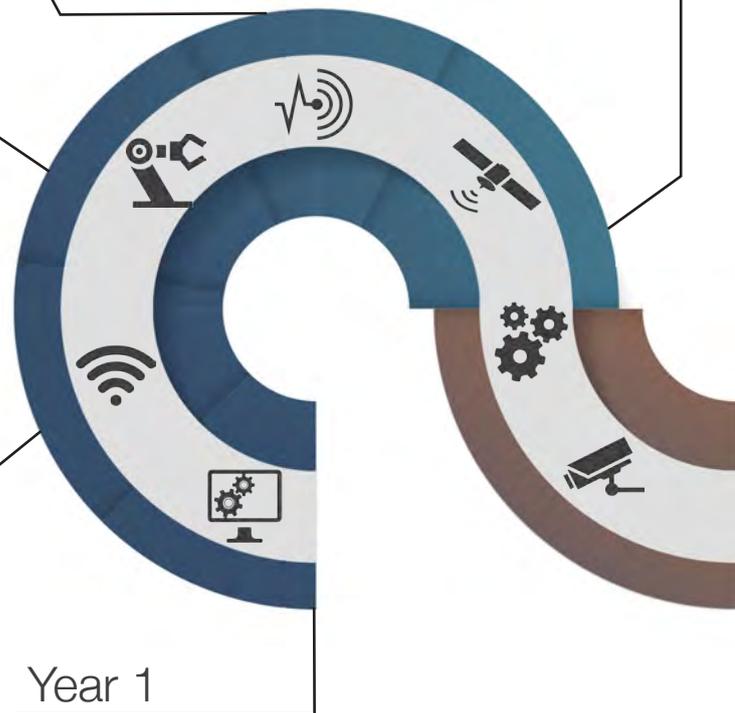
- Haptics, mechatronics and robotics research
- UX design and Materials engineering for ergonomics
- Hardware and software data storage, security & analysis

Year 2

- Low power, low cost, flexible sensor hardware for environment, atmosphere, obstacles, and voice recognition.
- VLSI Design and IoT device development
- Light weight bullet proof materials and blast proof materials.
- Advanced Manufacturing and micro machining research

Year 1

- GMP Manufacturing of Nano materials
- Materials engineering of fibres and fabrics
- Hand, electro oculography and gesture detection research



Management



Engineering

AI & Robotics

Years 11-15

- Make in India alignment with Frugal Innovation focus
- Societal Translation focus

Years 6 -10

- Scale-up of Manufacturing Research
- Voice enabled robotics and machines and devices

Sustainability & Resilient Communities

Interdisciplinary Research

Year 4

- Psychological and sociological impact of disasters and interventions
- Fault tolerant & resource constrained communication in extreme environments
- Integrated renewable energy systems: dye sensitized solar cells
- Solar thermal water purification and nano-filter development
- Smart EVs, and intelligent transportation systems

Year 5

- Disaster warning and mitigation systems
- Long Range internet in inaccessible land and water masses
- Green materials, devices & technologies
- Ground water conservation & optimized water distribution systems
- Sustainable income generation, entrepreneurship & micro-financing

Year 3

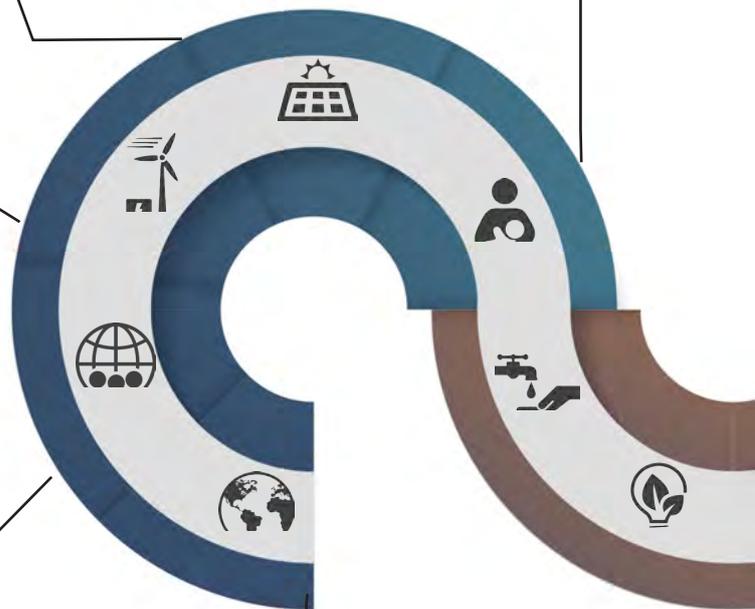
- Decision models for disaster prediction
- Technologies for rural connectivity and access (Mobile & Cellular)
- Energy Storage: Hydrogen storage, Li Ion liquid and solid state batteries
- Innovative materials and construction methods for toilet building
- Cyber forensics, blockchains & botnet detection

Year 2

- Sensors, drones & robotics for disaster management
- Context aware system for crop yield monitoring
- Monitoring, warning and management systems for avalanche, floods
- Microbial toilets for enhancing sanitation
- Embedded hardware security

Year 1

- Climate Change Models: atmospheric, slope stability, river flow & runoff
- Advanced antenna design, MIMO, Cognitive radio, TV whitespace
- Mobile and tablet technologies for rural development
- Effect of water contamination on water borne diseases
- Holistic women and child development



Environment



Social Sciences

Engineering



Years 11-15

- Sustainable food & agriculture
- Resilient communication & networking systems
- Smart sustainable communities
- Integrated water purification system deployment
- Smart Cities: sustainable transportation systems

Years 6 -10

- Monitoring, warning and management systems for landslides
- Deployment of communication systems for extreme environment
- Smart micro-grid technologies for rural electrification
- IoT based system for water and sanitation
- Big Data platform for sustainable development

Pedagogy & Learning Technology

Interdisciplinary Research

Year 4

- Digital Classroom as Flip Classroom
- IoT enhanced Science Labs
- Virtual Reality Science Education
- Design capacity composite maps

Year 5

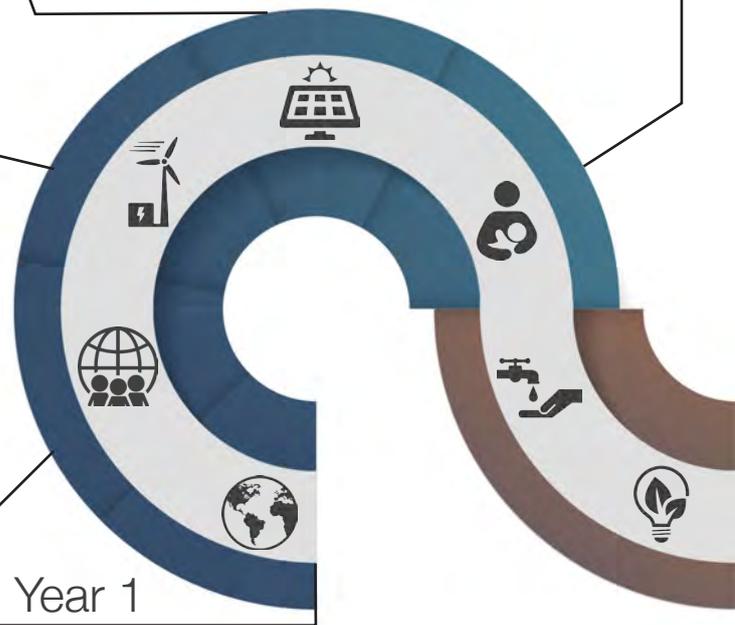
- Policy Research in eGovernance initiatives in Education
- Synchronous Multimedia Animations
- Research for low cost assistive technologies in language learning for the hearing impaired
- Internet of Things Applications in Learning

Year 3

- Personalized Learning in Organizations
- Learning Analytics & Business Intelligence
- Mobile-based cached assessments
- Serious Games

Year 2

- A framework to develop a road map for vulnerability (UNESCO Chair)
- Local & Cloud based Synchronization for Learning
- Assessment based on Cards: Image Recognition
- Haptics Solutions for Skill Development



Year 1

- Learning Analytics from large scale deployed eLearning Projects
- NeuroEducation & Linguistics for Dyslexia
- Personalized Language Learning
- Virtual Classroom

Cognitive Psychology



Neuroscience

Technology

Years 11-15

- Robots as Coaches/Mentors
- Image Recognition for E-Learning
- Natural User Interfaces
- Holographic teaching for vocational trades

Years 6 -10

- Robots as Teaching Assistants
- Assistive Technologies for Learning Challenged
- Medical Simulations enhanced with Holography
- Development of policy and interventional strategies in reducing vulnerabilities

Management Sciences

Interdisciplinary Research

Year 4

- Visual Aesthetics and Usability for Smart Devices
- Cross-cultural Behavior and Technology Adoption
- Social Exclusion, Pattern Analysis & Policy Intervention
- Absorptive Capacity, Opensource and Innovation Success
- Ethical Disclosure and Corporate Governance

Year 5

- Machine Learning in e-Retailing
- Agility in Education
- Value Chain Analysis, Nutrition and Technology
- Organisational Culture, Cloud Based Technology and Innovation Adaption
- Occupational Health and Safety in Health Care

Year 3

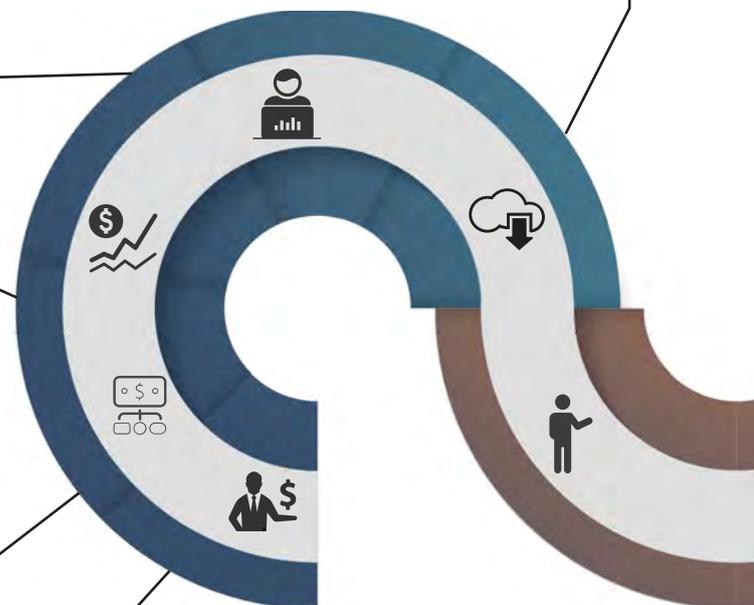
- Serious Management Games and Epistemic Networks
- Sustainable Energy Management and Consumer Behaviour
- Aspirations, Identity and Poverty Alleviation
- Frugal Innovation for Societal Benefit
- Policy Shocks and Stock Prices

Year 2

- New Business Models for the Sharing Economy
- Technology Adoption in e-government
- Consumer Behaviour, Low Income and Nutritional Security
- Innovation Approach, Information Technology and Human Resources
- Big Data, Behavioural Psychology, and Market Structure

Year 1

- MOOCs, Skilling and the Future of Careers
- Lean and Agility in Healthcare
- Marketing and Sustainable Consumption
- Systems Dynamics and SME Logistics
- Micro Finance and Public Debt

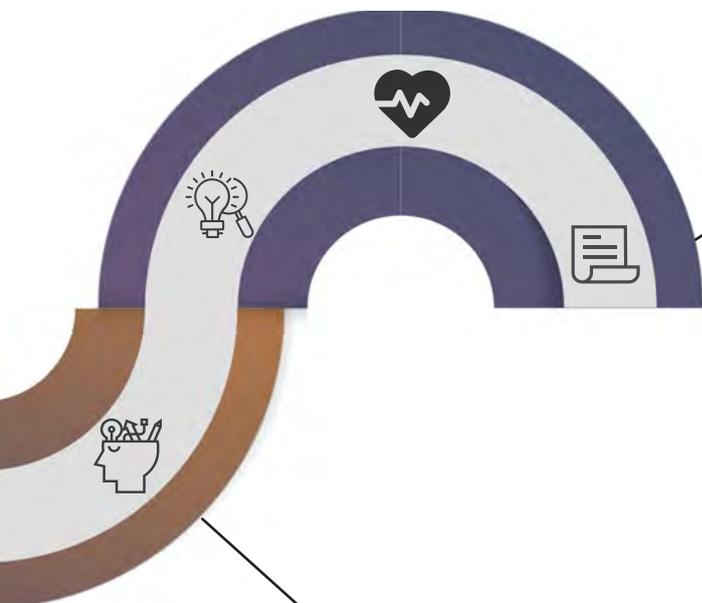


Management Sciences



Data Sciences

Social Sciences



Years 11-15

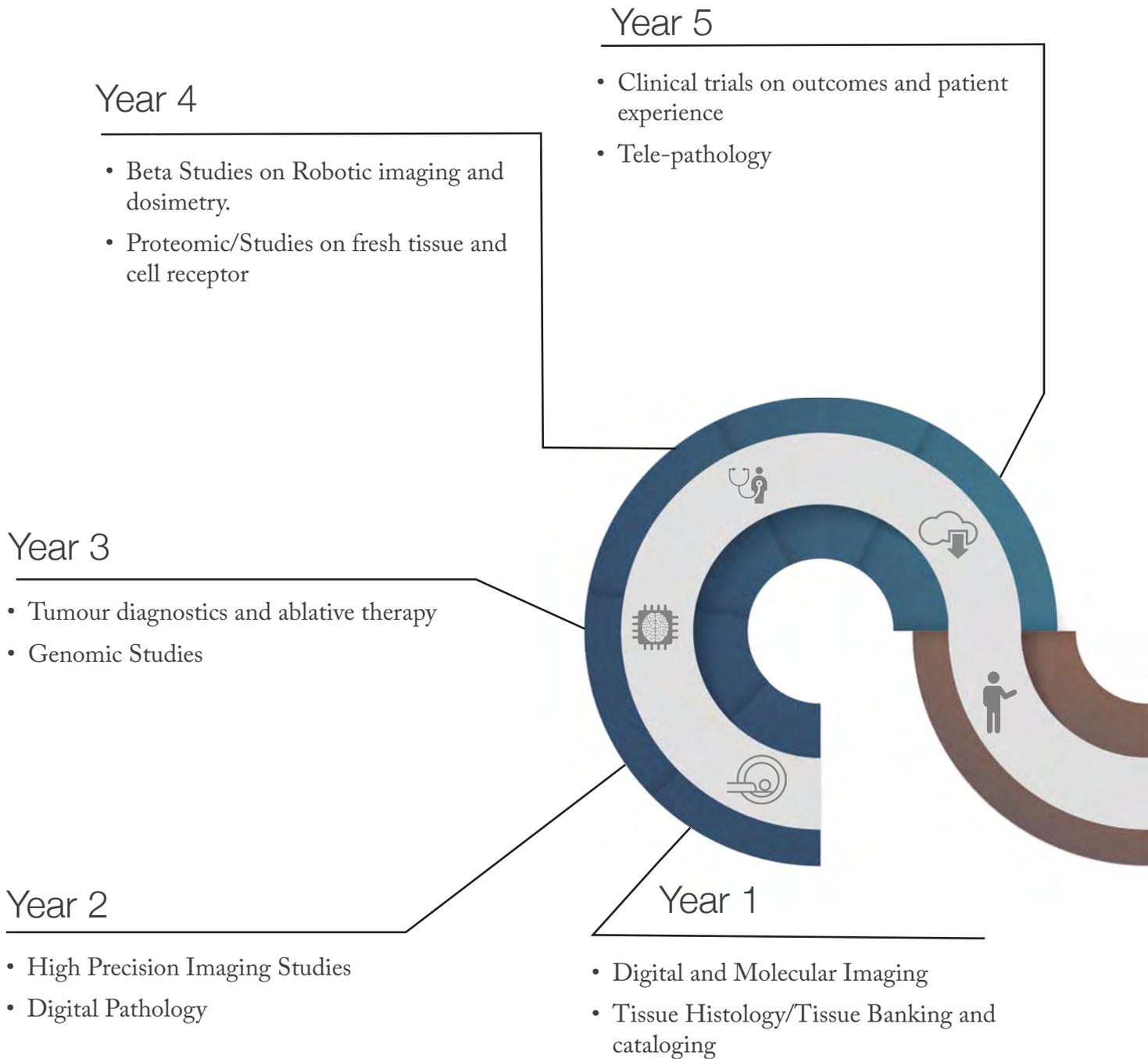
- Servicescapes, Biophilics and Green Marketing
- Branding of Smart Cities and Destinations
- Information Technology & Migration Pattern
- IoT, Technology Adoption and Entrepreneurship
- e-Governance, Regulation and Business Ethics

Years 6 -10

- Design Thinking, Ergonomics and Aesthetics
- IoT, Consumer Learning and Market Dynamics
- Behavioural Nudging, Technology Intervention and Public Policy

Medical Imaging & Robotics

Interdisciplinary Research



Clinical Diagnostics



Medical Imaging

Artificial intelligence



Years 11-15

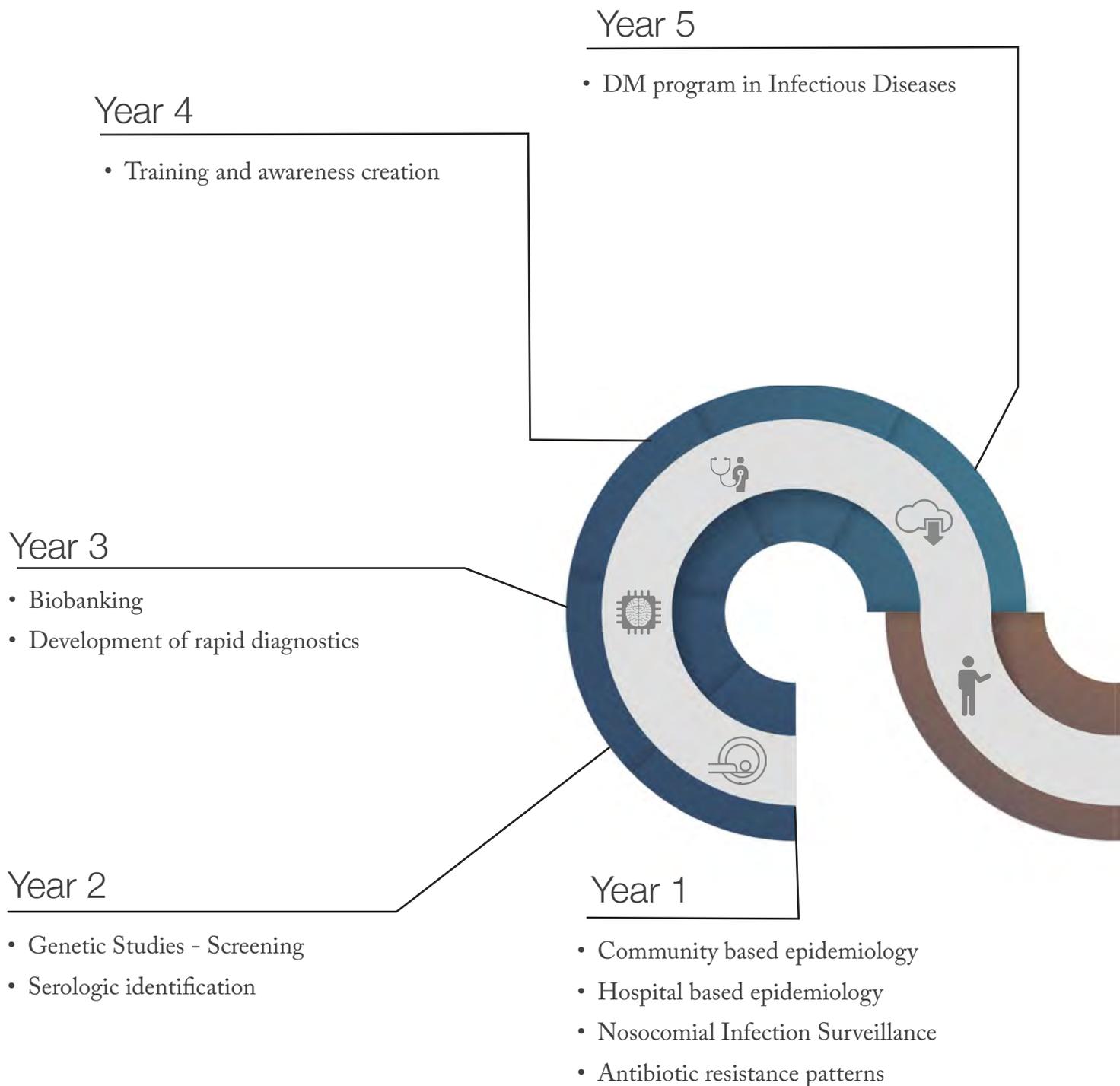
- Scale up patient numbers and long term outcomes, mortality and cure rates.
- Machine Reading
- Genomic Diagnostic

Years 6 -10

- Scale up of experiences with MI
- Robotic and automated Image acquisition.
- Increase safety through reduction in Radiation dosage studies of safety and outcomes
- Artificial Intelligence
- Scale up of histology involving all tissues - Bone Marrow, Liver, Brain
- Transplant histology diagnostic.

Health Sciences-Antibiotic Resistance

Interdisciplinary Research



Medical Sciences



Public Health

Informatics



Years 11-15

- Advanced Stem Cell Research
- Online registry of Sepsis
- Pharmacogenomics Studies
- Newer Antibiotic development
- Personalised and Precision Medicine related studies
- Specific bacterial/viral clinical trials

Years 6-10

- Rational use of antibiotics
- Regulatory Statutes
- Innovative Diagnostic testing & cytogenetics

4.2.2 It should offer inter-disciplinary courses, including in areas of emerging technology and interest as well as those of relevance to the development concerns of countries like India and also award degrees, diplomas and other academic distinctions in such interdisciplinary areas.

At present Amrita offers Interdisciplinary courses and also awards degrees. The proposed plan to enhance these offerings is presented below.

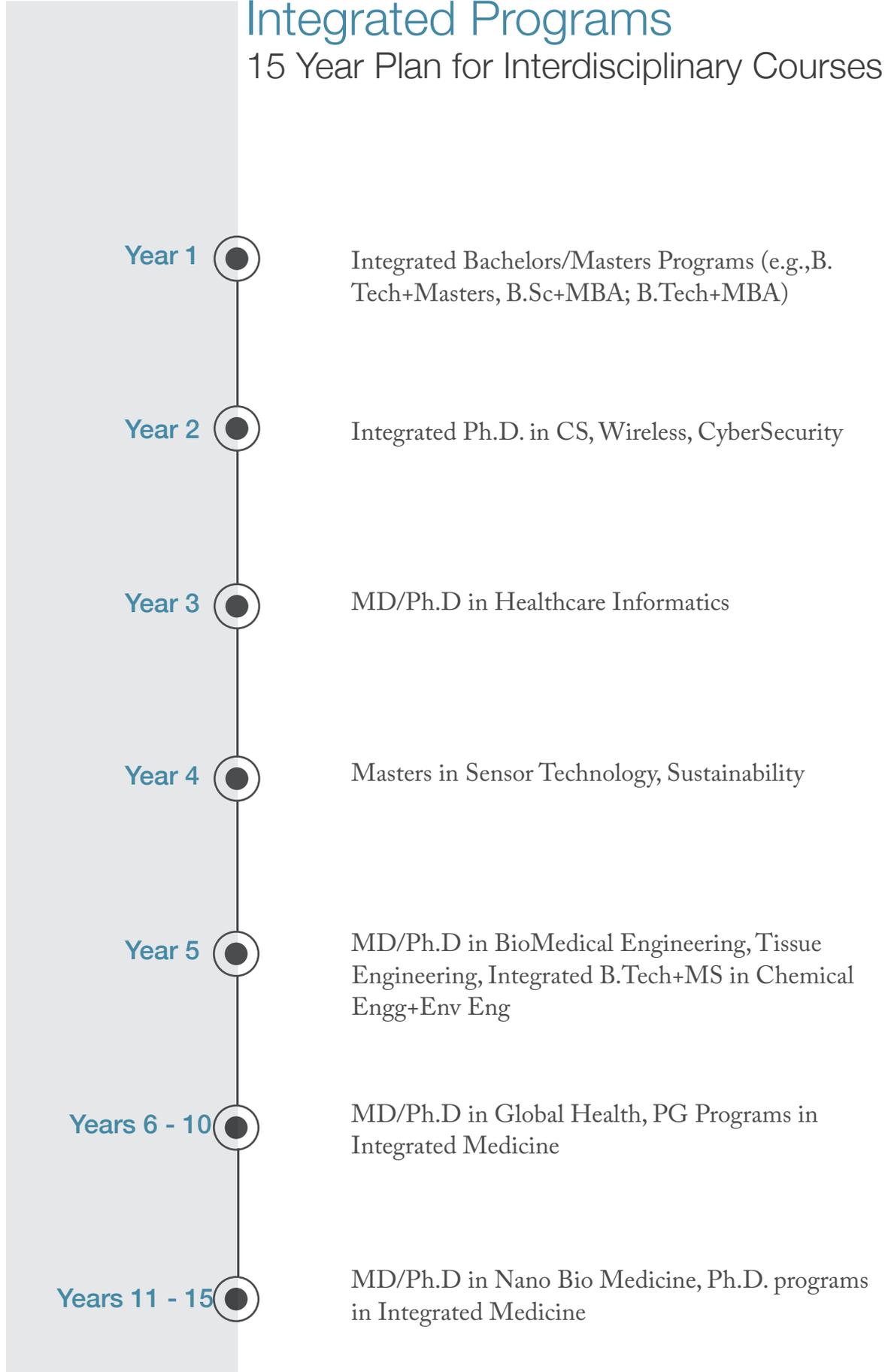
Masters Programs

15 Year Plan for Interdisciplinary Courses



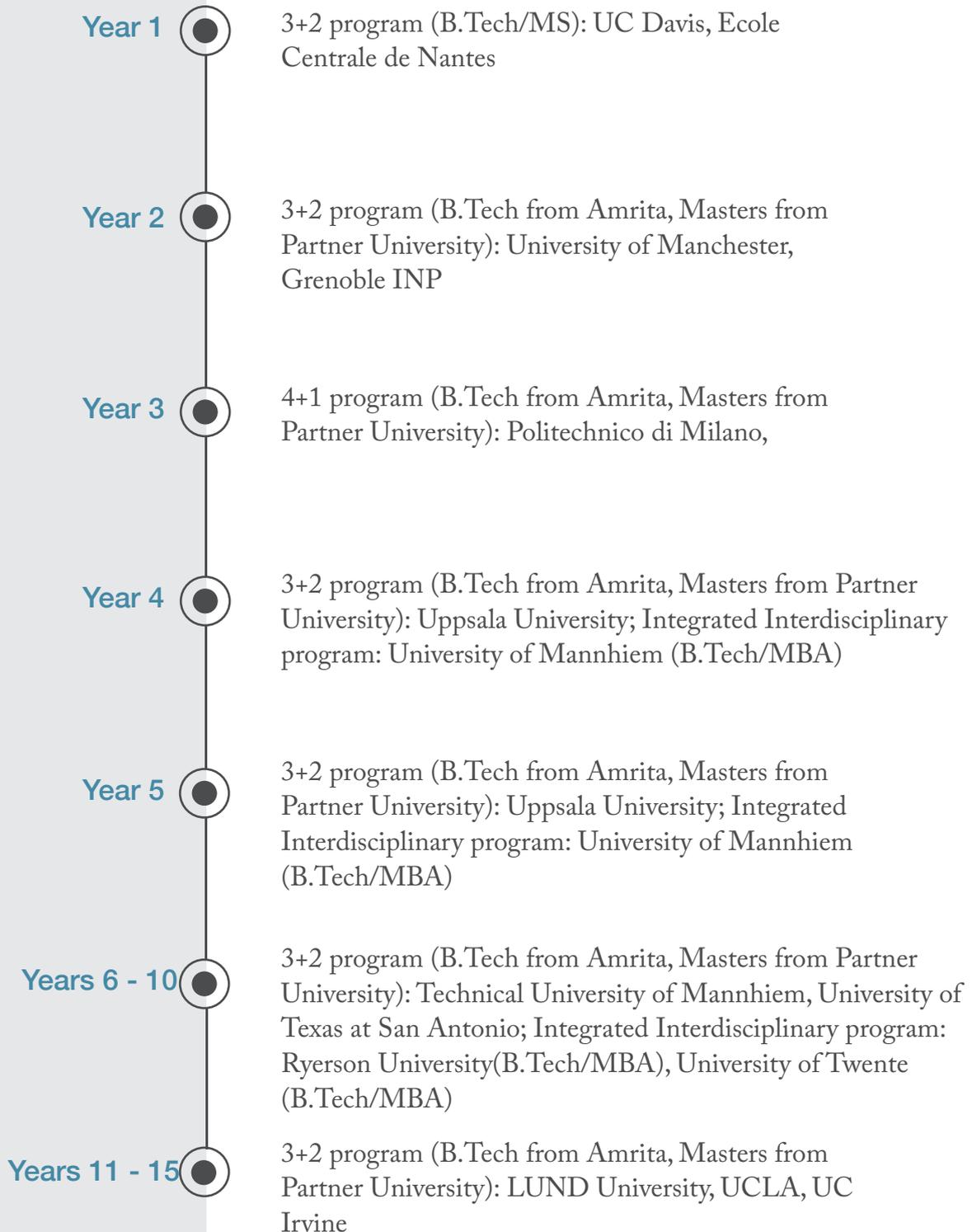
Integrated Programs

15 Year Plan for Interdisciplinary Courses



International Integrated Programs

15 Year Plan for Interdisciplinary Courses



International Dual Masters Degrees

15 Year Plan for Interdisciplinary Courses



Year 1

International dual degree program* with UB (MBA+MS in Management) and (Mtech + MS);
Dual Degree Program: Grenoble INP(M.Tech/MS)

Year 2

Dual Degree Program: UPC Spain (M.Tech/MS),
VU Amsterdam (M.Tech/MS)

Year 3

Dual Masters Degree: VU Amsterdam, University
of Twente

Year 4

Dual Masters Degree: University of Ireland,
University of Paderborn

Year 5

Dual Degree Program: University of Ireland
(M.Tech/MS), Aalto University (M.Tech/MS);
University of Missouri (MBA/MS)

Years 6 - 10

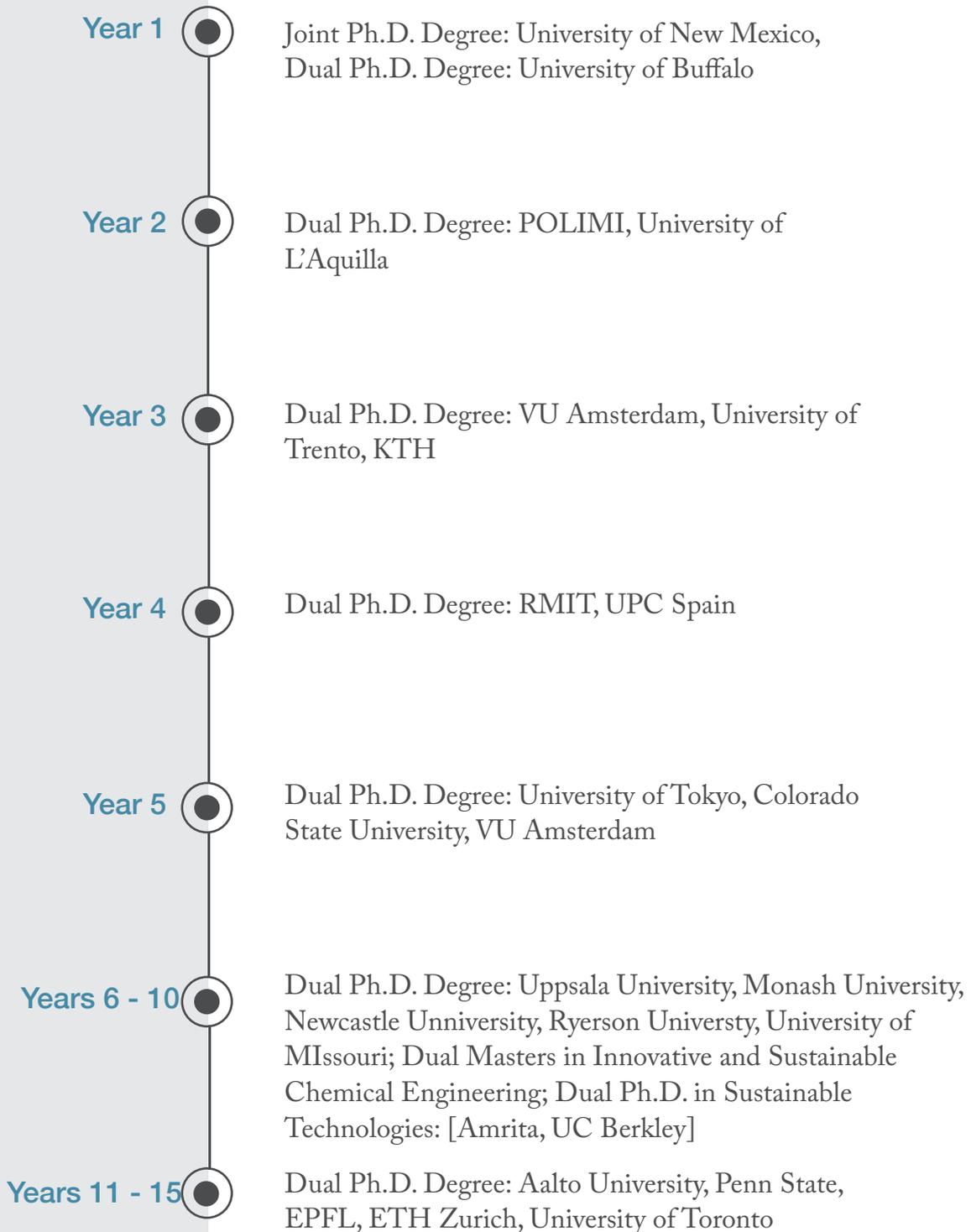
Dual Degree Program: University of Missouri
(M.Tech/MS), Aalto University (M.Tech/MS)

Years 11 - 15

Dual Degree Program: Newcastle University(M.
Tech/MS), University of Zurich (M.Tech/MS),
Columbia University (M.Tech/MS)

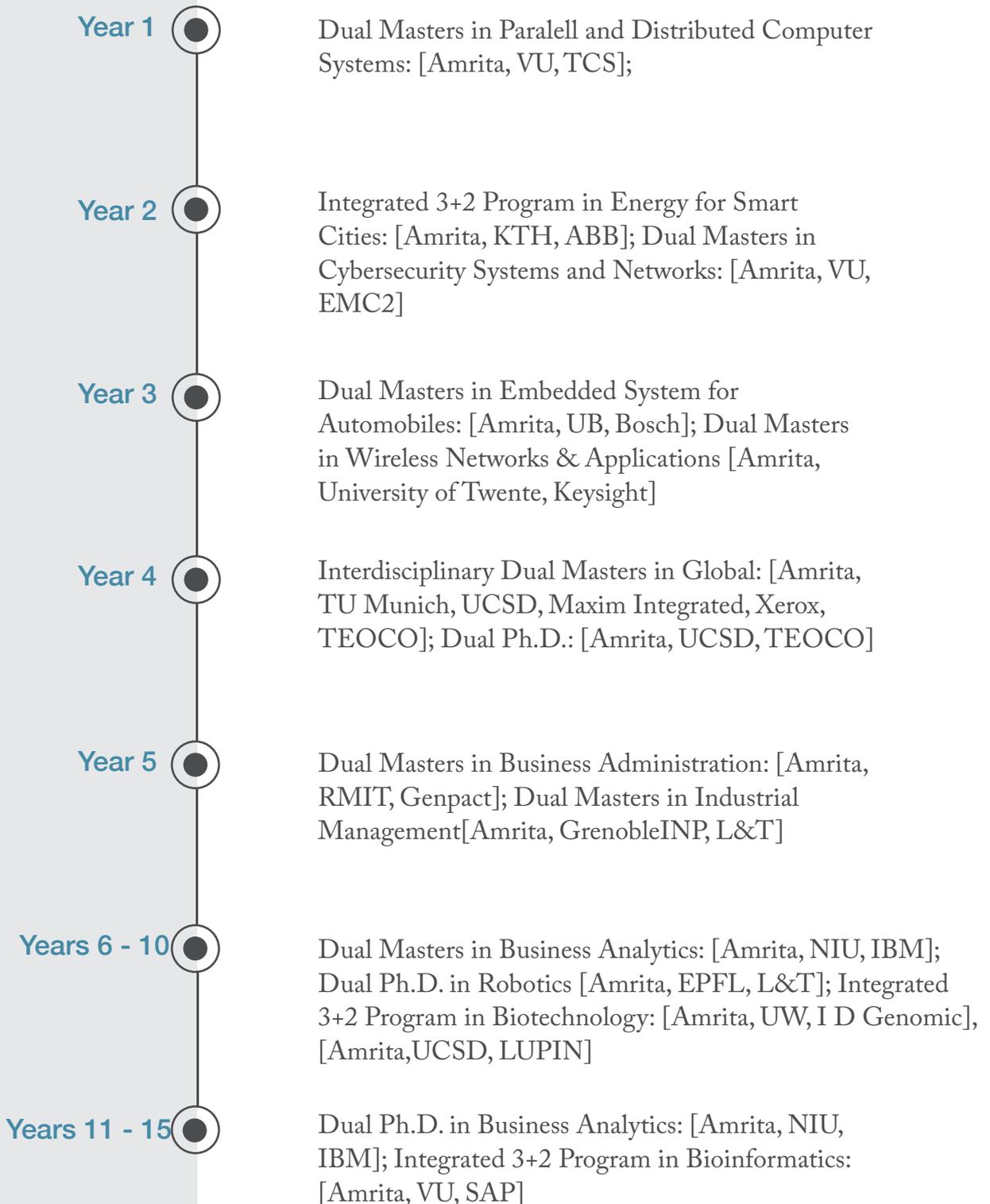
International Dual/Joint Ph.D. Degree

15 Year Plan for Interdisciplinary Courses



International Industry Degree Programs

15 Year Plan for Interdisciplinary Courses



Social Sciences - Programs

15 Year Plan for Interdisciplinary Courses



4.2.3 It should have a good proportion of foreign or foreign qualified faculty. Foreign / foreign qualified faculty means:

a. Any faculty of non Indian citizenship.

Or

b. Any Indian citizen who has spent considerable time in academics in a foreign country, with his academic qualification /experience from top 500 Institutions figuring in a reputed world ranking.

Amrita has number of Foreign/NRI returns engaged in teaching, research and guiding Ph.D. students. The % of foreign faculty is about 10% and we plan to increase it to 15% in 5 years and 30% in 15 years. The table below shows the milestones followed by a list of action plans to achieve the same.

Milestones:

	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Total Foreign Faculty	178	227	245	297	359	419	660	1098
Total Faculty	1700	1893	2042	2285	2566	2791	3299	3659
% Foreign	10.4%	11.0%	12.0%	13.0%	14.0%	15.0%	20.0%	30.0%

Action Plan

- Reach out to Ph.D. scholars known to us through our international university collaborators.
- Establish tenure system and quantified research productivity benchmarks for promotions that will appeal and draw the international faculty to join Amrita.
- Many of our non Ph.D. foreign faculty are currently enrolled in Ph.D. studies, and are expected to graduate and continue as faculty.
- Advertise for international faculty through social media, web sites, academic journals, select magazines for open positions in select areas.
- Recruitment of faculty with international experience will continue 3-4 times a year when a dedicated committee travels to recruit graduates from US, Germany, UK, Australia and Netherlands; for Nano-Bio-Medicine areas - US, Italy, UK; for Digital Health - Germany, Argentina, Italy and Russia; for Integrative Medicine - Japan, US, Singapore, Germany and Korea; for Manufacturing - Canada, US, Switzerland and France.
- Recruit strong Ph.D. faculty through Amrita's student exchange program.
- Establish a monthly seminar program for international Ph.D. graduates as a means of recruiting strong candidates.

4.2.4 There should be a reasonably good mix of Indian and foreign students.

We plan to increase the proportion of foreign students from the present 2% to 7% in 5 years 25% over 15 years. The following table shows the milestones followed by specific action plans to achieve the same.

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
% Foreign Students	2 %	3 %	4 %	5 %	6 %	7 %	15 %	25 %

Action Plan

- To create a Network of International Student Admission offices in Europe (Germany), North America (Chicago and San Ramon, CA), South Asian Countries (Singapore), Middle East (Dubai), Africa (Nairobi, Kenya) and Australia (Melbourne).
- Conduct town hall meetings annually at our international offices at the start of admission seasons for prospective students.
- Offer Chancellor’s fellowships for 25 highly accomplished foreign students per year, for the PG and doctoral studies.
- Leverage our upcoming state-of-the-art campuses in Delhi NCR to attract foreign students.

4.2.5 There should be a transparent merit based selection in admissions, so that the focus remains on getting meritorious students.

A clear admissions policy for all programs that is well articulated. Enrolments are made by short-listing meritorious students by conducting Amrita’s own or using the ranks/score in standard competitive examinations - conducted at national and international levels.

Action Plan

- Direct admission with waiver of age and completion of formal schooling requirements for highly gifted students.
- Offer Ph.D. fellowships for domestic students (about 100 in number per year) and teaching assistantships (about 200 in number per year).
- Add GATE and CSIR qualifications for PG students in the future.
- Add SAT and GRE scores as a criteria of admission for foreign students to improve the quality of admitted students.

4.2.6 The admission process should be need-blind - so that once a student gets admission purely on merit, such a meritorious student should not be turned away for lack of financial ability.

Amrita's admission is already need-blind.

- For all Admissions - Amrita conducts Amrita Entrance Examination. Students are admitted purely on the basis of the rank secured in the Entrance Exam.
- For International Admissions - Students are admitted on the basis of International Exams like GRE / GMAT / TOFEL.
- All admissions are based on merit and no meritorious student is turned away due to financial constraints on the students part. Amrita offers students various financial options as outlined in Scholarship Policy [Part 1 Section 4.E of the proforma]

4.2.7 The faculty student ratio should be not be less than 1:20 at the time of notification issued declaring an Institution as an Institution of Eminence and should increase over time so as not to be less than 1:10 after five years of this date. The faculty for this purpose includes the regular faculty, adjunct faculty, and long term faculty (for at least three years). Part time faculty shall not be counted for the purpose.

The current faculty to student ratio of Amrita is 1:12, and this ratio is quite in the neighbourhood of our target, 1:10. By 5th year we plan to meet this target by executing along the actions plans listed immediately below the following table.

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Students	20200	21770	23480	25130	26940	27910	32990	36590
Increase in Students		1570	1710	1650	1810	970	5080	3600
Total Faculty	1700	1893	2042	2285	2566	2791	3299	3659
Increase in faculty		193	149	243	281	225	508	360
FS Ratio	1:12	1:11.5	1:11.5	1:11	1:10.5	1:10	1:10	1:10

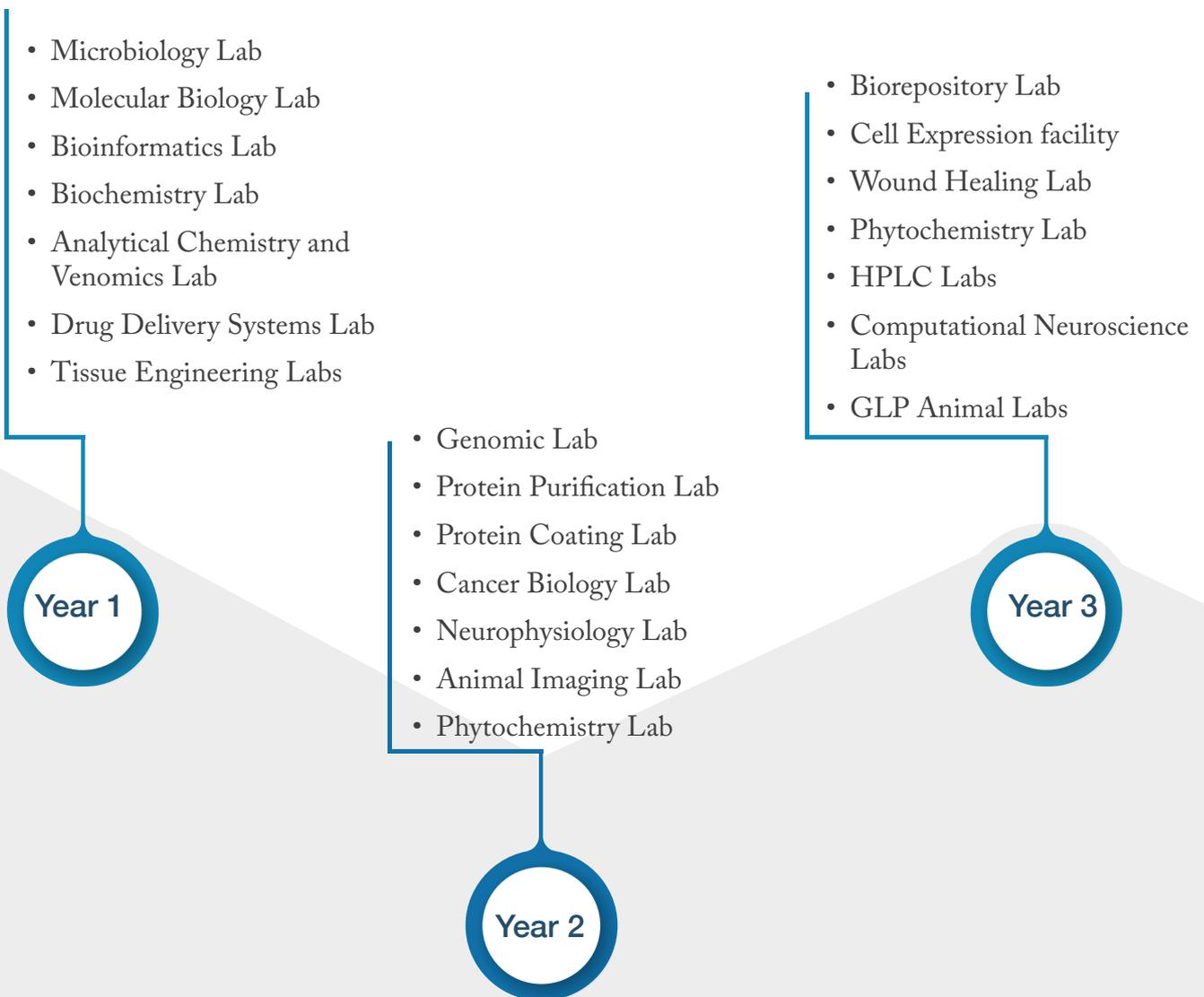
Action Plan

- Attract highly qualified faculty with startup grant packages for upto 25 lakhs/year.
- Setting up International Centers in US & Europe to coordinate foreign recruitment drives.
- Target recruitment in experimental thrust areas such as medicine, nanosciences, biotechnology, data sciences, robotics, cybersecurity etc.
- Starting in the third year, leverage state-of-the-art ,new upcoming campus in Delhi NCR to attract diversity of highly qualified faculty.

4.2.8 There should be laboratory facilities to undertake cutting-edge scientific research for those Institutions of Eminence Deemed to be Universities doing scientific research. In case of humanities, social science and other interdisciplinary areas, the faculty should be engaged in research and fieldwork in Frontier areas using the latest methodologies.

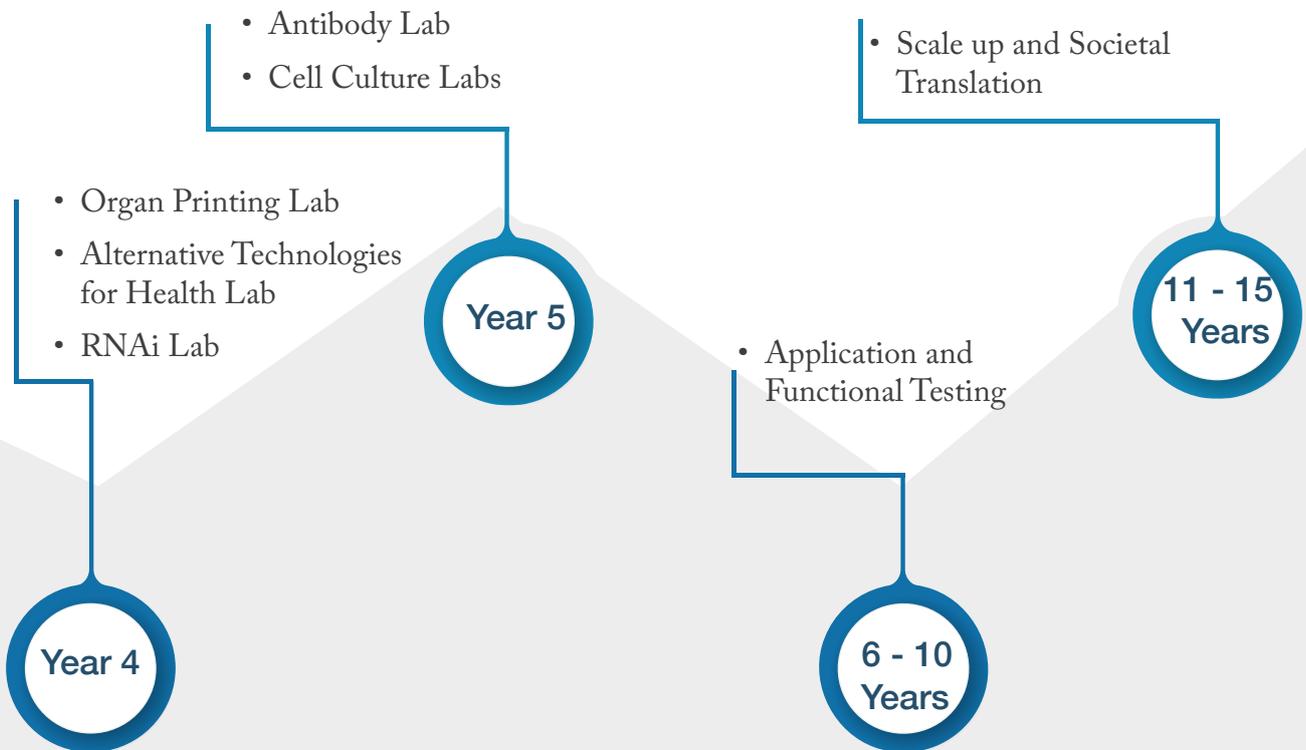
Comprehensive Plan to Establish Research Laboratories

Faculty of Medicine Labs



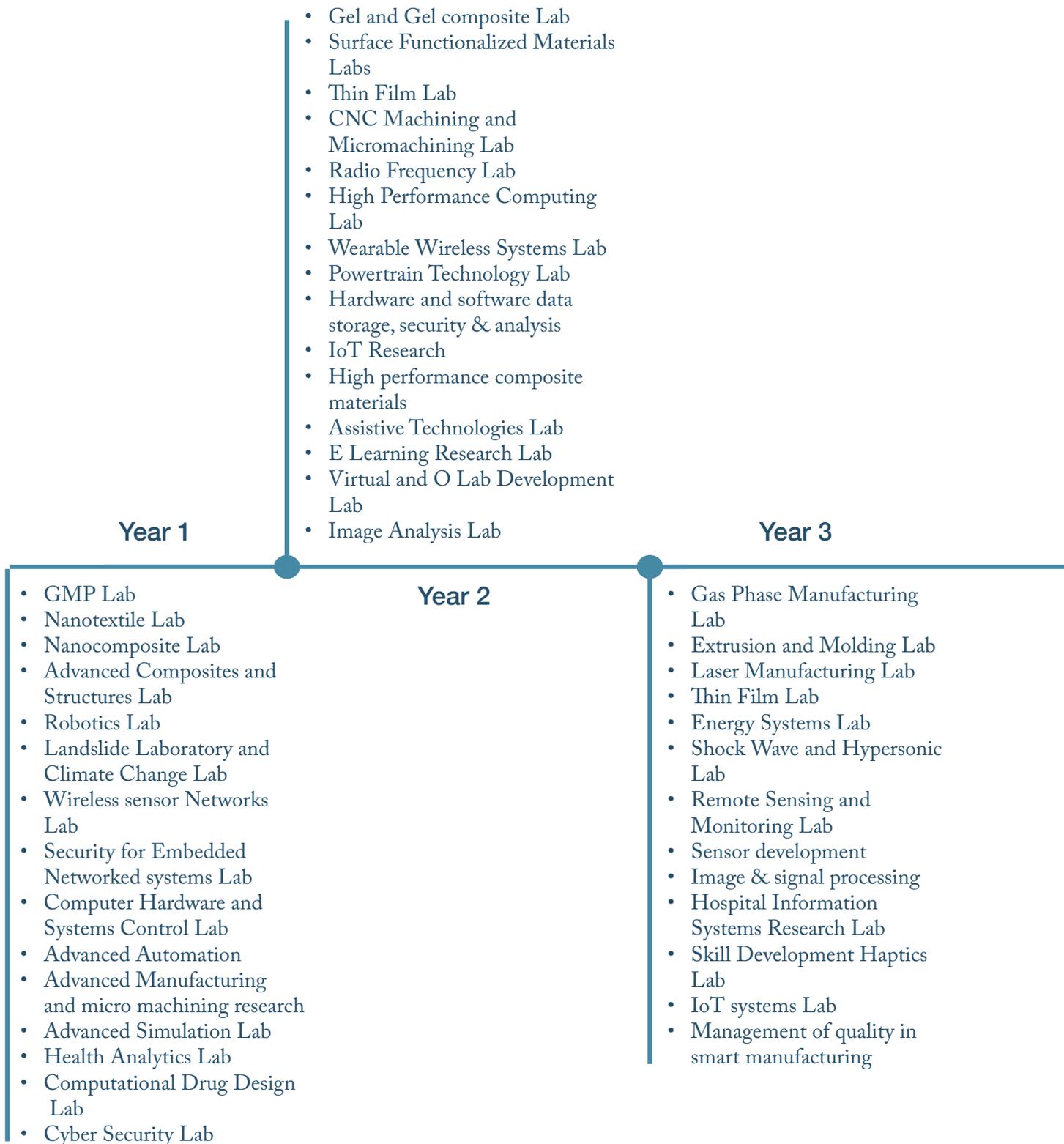
Action Plan

- Expand the activities of existing research centers to help further increase university research output (increase research infrastructure investment by 100% in 10 years; increase faculty recruitment in interdisciplinary Centres by 50-75% in 10 years)



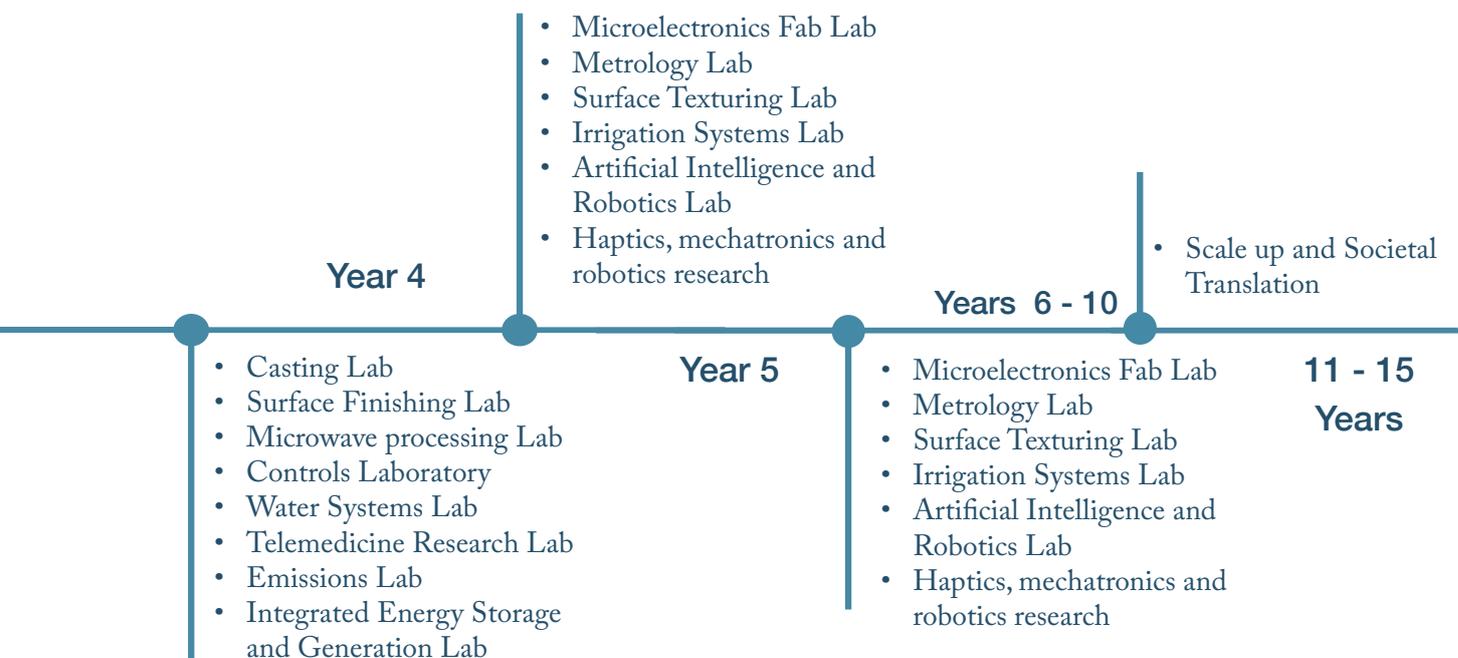
Comprehensive Plan to Establish Research Laboratories

Faculty of Engineering Labs



Action Plan

- Establish 10 lakh square foot research lab space that will provide space for research including basic equipments.
- Establish a Centre for Manufacturing Research which will provide facilities for research in mechanical, electronics and additive manufacturing, where facilities will be common to the entire university. Approximately, 100,000 sq ft space is planned for this Centre



4.2.9 The Institution of Eminence Deemed to be University should strive to achieve social impact by engaging in applied research and innovation in issues of concern to developing societies.

The outcomes derived from the execution and field deployment of several successful programs and research activities at Amrita is tabulated below. The planned future impact is detailed as yearly milestones.

Milestones:

Program	Current Year	Year-1	Year-2	Year-3
No of Villages selected for Live-in-Labs®/Amrita SeRVE Projects	22	28	34	40
Providing clean drinking water system to 5000 villages	1000	1000	1000	1000
AIMS free treatment projections (in Rs. crores)	36	40	44	50
Count of patients (in lakhs) given free treatment	8	8	9.5	10
Telemedicine beneficiaries	35,000	40,000	45,000	50,000
Vidyamritam Scholarships (in Nos. since 2008)	51,000	53,000	56,000	59,000
Teachers training	22,500	26,000	30,000	33,500
Olabs Free Online Experiments (Beneficiaries)	170,780	190,000	200,000	210,000
A-View Beneficiaries (in Lakhs)	20	22	24	26
Vocational Skills Training (rural women trained)	4,954	5,500	6,050	6,700
Swatch Bharat (no of hours of service rendered per year)	420,000	500,000	535,000	570,000
Student Social Responsibility Projects (in hours)	125000	150,000	200,000	250,000
Village Education Beneficiaries- AmritaRITE	5,827	6,500	7,500	8,500

Year-4	Year-5	Years 6 -10	Years 11-15	Remarks
46	52	75	101	101 villages selected for all round development by the University
1000	1000	0	0	Project of providing clean drinking water to 5,000 villages to be completed in 5 years
55	60	80	110	AIMS hospital under School of Medicine provides partially or fully free treatment to 65 % of patients
10	12	16	24	
55,000	60,000	1,20,000	1,50,000	
62,000	65,000	70,000	75,000	
37,000	40,000	55,000	70,000	
220,000	230,000	250,000	300,000	No of students who have benefited from Online Virtual Lab experiment courses
28	30	39	50	A-View is our Digital Learning platform
7,400	8,100	30,000	34,000	
610,000	645,000	735,000	900,000	Each student is required to do 25 hours of Swatch Bharat service in a year
300,000	350,000	1,750,000	1,750,000	Students implement SSR projects lasting around 50 hours over a duration of one semester
9,000	10,000	15,000	20,000	Students impacted by our rural education project in villages adopted by the M.A. Math

Action Plan

Listed below are the societal impact technologies/programs developed at Amrita. Most of them have interdisciplinary character. In the coming years these programs will be given further impetus by enhancements and remodelling to achieve the planned impacts as given in the milestones table above.

- Landslide detection and oceannet program which provides support to villagers and fishermen through innovative low cost technologies.
- Live-in-Labs® program outreach to rural areas; villages impacted by Amrita SERVE program.
- Low cost medical devices developed by Center for Wireless Networks and Applications (WNA) and the Center for Nanosciences and Molecular Medicine.
- Low cost medicines developed by Center for Nanosciences and Molecular Medicine.
- Smart grids for rural areas developed by WNA.
- Yoga meditation and awareness camps for students.
- Swachh Bharat community cleanup programs instill societal service values in all students.
- Cataract surgeries in India and African Countries.
- Antibiotic stewardship programs for patients.
- Cutting-edge organ transplants for poor.
- Free health camps every year with involvement of students.
- Telemedicine centres globally for Disaster Relief.

4.2.10 The Institution of Eminence Deemed to be University should develop teaching and research collaborations with a reasonable number of global universities figuring in the” most reputed global rankings

Amrita has Memorandum of Understanding (MOUs) for International collaborations in the areas of Research and Academics with 180 World Ranked Universities over the last twelve years.

Listed Below are some of the existing Teaching & Research Collaborations.

Faculty of Medicine

Lucille Packard Children’s Hospital (Stanford University) Intensive Care Research on postoperative outcomes, Children’s Hospital at Boston (Harvard Medical School) for Dr.Jane Newburger Fellowship exchange, Harvard School of Public Health for Community Based Research overseas location for MPH students, Addenbrooke’s Hospital of Cambridge University Hospitals for Faculty exchange programme in Transplant Surgery, Cincinnati Children’s Hospital Medical

Center (USA), Des Moines University College of Podiatric Medicine and Surgery, University of Toledo(USA), Mc Master University in Canada, Rosewell Park Cancer Institute at New York (USA), Birmingham University (U.K), University of Warwick for MD/MS/Ph.D twinning programmes, College of Medicine, University of Ilorin Teaching Hospital (Nigeria), Heilbronn University (Germany), Kings College London, Graduate School of Medicine of MIE University (Japan)

Centre for Nanosciences and Molecular

Medicine has Collaborations with Stanford University, University of Connecticut Health Centre, Rice U, Houston, North-eastern U, Boston University, Harvard University, Brigham and Women's Hospital, University of Colorado, University of Massachusetts, National University of Singapore, Monash University, Australia.

Faculty of Sciences

Collaborations with Oxford University, University of California San Diego, University of Durban (South Africa), University of Washington.

Faculty of Engineering

Collaborations include Massachusetts Institute of Technology, Oxford University, Stanford University, Harvard University, Boston University, University of Colorado, University of Massachusetts, National University of Singapore, University of California Davis, University of Tokyo, University of California San Diego, Vrije Universiteit Amsterdam, Technical University of Munich, King's College London, Newcastle University, University at Buffalo, University of Connecticut Health Centre, Rice University, University at Houston, NorthEastern University, University of Mannheim, Federal University of Rio de Janeiro, Pontifical Catholic University of Rio de Janeiro, Bundeswehr University in Munich, Jacobs University in Bremen, University of Mannheim, University of Kaiserslautern, University of Roma Tre, Freie Universität Berlin, Technisches Hilfswerk, Indian Institute of Science, Bangalore, IIT Mumbai, IIT Kanpur, IIT Delhi, Indian Institute of Space Science and Technology, Indian Institute of Information Technology and Management

Faculty of Management

East Carolina University (USA), University of Adelaide (Australia), University at Buffalo (USA), Indian National University at Canberra (Australia), University of Uppsala (Sweden), Sustainable Development Policy Institute at Islamabad (Pakistan), University of Amsterdam, (Netherlands), University of Manitoba (Canada), University of Ghana and Kwame Nkrumah University of Science and Technology, International Development and Trade Research Group at RMIT University (Australia), U Bangladesh Agricultural University, Federal Urdu University for Arts Science and Technology, Pakistan and Tribhuvan University (Nepal), University of Salford (UK)

MOUs with World's Top 500 Universities

S. no.	Collaborating University	QS World Rankings' 18
1	 Stanford University, USA	2
2	 Harvard University, USA	3
3	 University of Oxford, UK	6
4	 University of Chicago, USA	9
5	 École polytechnique fédérale de Lausanne (EPFL), Switzerland	12
6	 Princeton University, USA	13
7	 Cornell University, USA	14
8	 Yale University, USA	16
9	 Columbia University, USA	18
10	 Australian National University	20
11	 University of Michigan, USA	21
12	 University of California at Berkeley, USA	27
13	 University of California, Los Angeles, USA	33
14	 University of California at San Diego, USA	38
15	 Carnegie Mellon University, Pittsburgh, USA	47
16	 Delft University of Technology (TU Delft), Netherlands	54
17	 University of Wisconsin-Madison, USA	55
18	 Monash University, Australia	60
19	 University of Washington, USA	61

20	 TECHNISCHE UNIVERSITÄT MÜNCHEN	Technical University of Munich, Germany	64
21		University of Texas at Austin, USA	67
22	 ILLINOIS	University of Illinois at Urbana-Champaign, USA	69
23		Georgia Institute of Technology, USA	70
24	 KTH	KTH - Royal Institute of Technology of Stockholm, Sweden	98
25	 PURDUE UNIVERSITY	Purdue University, USA	105
26	 UPPSALA UNIVERSITET	Uppsala University, Sweden	112
27	 university of groningen	University of Groningen, Netherlands	113
28		University of California, Davis, USA	118
29		University of Maryland, College Park, USA	129
30	 UCSB UNIVERSITY OF CALIFORNIA SANTA BARBARA	University of California, Santa Barbara, USA	134
31	 TKK	TKK - Helsinki University of Technology, Finland	137
32	 Aalto University	Aalto University, Finland	137
33	 RWTH AACHEN UNIVERSITY	RWTH Aachen University, Germany	141
34		University of California, Irvine, USA	164
35	 UCD	University College Dublin	168
36	 POLITECNICO MILANO 1863	Politecnico di Milano, Italy	170
37		Università di Bologna, Italy	188
38	 Radboud University	Radboud University, Netherlands	204
39	 ASU ARIZONA STATE UNIVERSITY	Arizona State University, USA	209

40		Vrije Universiteit, Netherlands	218
41		University of Massachusetts Amherst, USA	249
42		Technische Universität Darmstadt, Germany	272
43		Universitat Politècnica de Catalunya (UPC), Spain	275
44		University of California, Santa Cruz, USA	301
45		University of Porto, Portugal	301
46		Politecnico di Torino, Italy	307
47		UFRJ: Federal University of Rio de Janeiro, Brazil	311
48		University at Buffalo, The State University of New York, USA	318
49		University of California, Riverside, USA	323
50		Northeastern University, USA	346
51		Tampere University of Technology, Finland	380
52		State University of New York at Stony Brook, USA	382
53		University of Mannheim, Germany	388
54		University of Georgia, USA	421-430
55		University of Trento, Italy	441-450
56		University of New Mexico, USA	461-470
57		Colorado State University, USA	481-490
58		UPM – Universidad Politécnica de Madrid, Spain	491-500
59		University of Guelph, Canada	491-500

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Total International collaboration with Top 500 World Ranked Universities	59	65	70	75	80	90	150	200
Total Faculty	1700	1893	2042	2285	2566	2791	3299	3659
% Foreign	10.4%	11.0%	12.0%	13.0%	14.0%	15.0%	20.0%	30.0%

Action Plan:

- Extend and reinstate alliance with current international collaborators with focus on Interdisciplinary academic programs and research areas.
- MoUs with special focus on top 500 world ranked universities.
- Co-Guiding students: at least 5% of Masters and Ph.D. students to be co-guided by International faculty.

4.2.1 1 (i) The Institution of Eminence Deemed to be University should have:

For existing private Institution, an initial corpus fund of Rupees 60 crore which would be increased at an annual uniform rate to Rupees 150 crore in ten years time and guaranteed pipeline of Rupees 500 crore, along with a credible plan for additional Rupees 500crore.

Sponsoring Organization has a corpus which meets the needs for the 15-year targets (>1000Cr.)

(ii) The source of funds should be known and should be available for scrutiny by competent authorities.

Sponsoring Organization is a registered public charitable trust and files its annual returns with respective regulatory bodies. All funding is scrutinized by competent authorities in government year-over-year and the organization submits annual certified financial accounts.

4.2-12 The institution of Eminence Deemed to be University should be known for promoting a culture where faculty are encouraged -to publish regularly in peer-reviewed journals and engage academically with the issues of concern to the society. It should have a record of research publications at the mean rate_ of at least one per faculty member each year in reputed peer reviewed international journals based on publication made by top 100 global Universities in these journals. For this purpose:

- Any paper published in international publications which are included in Scopus, Web Science or similar international agencies can be counted.

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Papers Per Faculty/Year	0.6	0.7	0.8	0.9	1.0	1.2	2.0	2.5
Citations per paper per year	3.5	3.7	3.9	4.3	4.6	5.0	7.0	9.0

Action Plan

- Expand support for data collection through field studies & research facilitated through the work done by parent NGO and collaborations with Industry.
- Foster research orientation mind-set among faculty members, by instituting recognition and awards for “Best Paper of the Year” awards or other similar schemes.
- Broaden the access to Scopus, SciVal for each faculty to identify and target high impact journals for submitting publications.
- Regularise monthly monitoring to review research projects, publication outcomes etc.
- Reduced administrative and academic work loads for faculties with higher level of commitment on research, creative thinking and publications.
- Increased support for presentations at reputed conferences.
- Semi-annual research methodology and technical writing workshops open to all faculty, mandatory to those with low publications.

4.2.13 The Institution of Eminence Deemed to be University should have a world-class library with subscriptions to reputed journals in the areas of course it is offering.

- We have excellent library infrastructure with subscription to reputed journals. Our libraries have a collection of over 2,52,000 books and 6,98,727 eBooks and digital assets. To support a strong research culture among the faculty and student communities, Amrita has subscription to more than 50,000 world class journals and e-journals through databases like ScienceDirect, PubMed, Springer Link, IEEE, ACM, ProQuest, EBSCO etc., and abstracting databases like Scopus, Web of Science.
- The plan is to increase the collection of books to 3,15,000 and eBooks & digital assets subscriptions to 8,25,000 and 72,000 Journals & e-Journals in 10 years, respectively. The milestone plan is depicted in the table below.

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Books	2,52,000	2,60,000	2,66,000	2,72,000	2,78,000	2,85,000	3,15,000	3,50,000
Journals & e-Journals	50,000	50000	52000	55000	67000	70000	72000	75000
eBooks & Digital Assets	6,98,727	7,10,000	7,20,000	7,30,000	7,40,000	7,50,000	8,25,000	9,00,000

Action Plan

- Focus will be on increasing access to new databases, eBooks, e-journals etc.
- In addition to the existing infrastructure, we shall set up world class libraries in the campus proposed at Delhi NCR.

4.2.14 The Institution of Eminence Deemed to be University should have student amenities comparable with that of globally reputed institutions.

We have excellent student amenities including outdoor and indoor stadiums, multiple auditoriums and convention centers, Olympic size swimming pools, gymnasiums, multi-cuisine restaurants, living spaces for students and faculty etc. But based on the projected growth of academic and research programs, amenities will have to be augmented. Yearly plan is tabulated below followed by an action plan to realise it.

Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Sport Facilities like Stadiums, Gyms, Swimming Pools (Acres)	5.4 Acres	6 Acres (Total)	7 Acres (Total)	8 Acres (Total)	9 Acres (Total)	10 Acres (Total)	14.5 Acres (Total)	20 Acres (Total)

Action Plan

- Additional boarding facilities for increasing enrolment of International students.
- Increase number of multi-cuisine cafeterias, entertainment facilities at all campuses in 10 Years.

- Increase to over 1 Crore square feet in 10 years the hostels and living spaces for accommodating national and international students and faculty, with state of the art Guest houses. About 70 lakh square feet facility is already meeting the present requirements.
- Enhancement of 1.5 lakh square feet of space for an auditorium and convention centre in our medical campus in the first 3 years.
- Additional auditorium and convention centre is planned in Amritapuri campus in an area of 3 acres.
- Parks and recreation spaces will be created in almost 30% of proposed campuses.

4.2.15 The Institution should be accredited by National Assessment and Accreditation Council (NAAC) or an alternative version of NAAC which conforms to UGC (Institutions of Eminence Deemed to be Universities) Regulations, 2017 or its amendments and also be assessed by at least one reputed international accreditation agency, one whose ratings are a credible and widely accepted global benchmark. The Institution may however appeal on accreditation of NAAC or alternative version of NAAC to the Empowered Experts Committee, whose decision shall be final.

The table below gives a snapshot of current and a future plan of accreditation.

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
NAAC	'A' grade	Highest	Highest	Highest	Highest	Highest	Highest	Highest
ABET	No	Start	Yes	Yes	Yes	Yes	Yes	Yes
NBA	No	Start	Yes	Yes	Yes	Yes	Yes	Yes
NABL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NABH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AACSB	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Others	Healthcare - ISO 9002-2000	ISO Certified	ISO Certified					
International Accreditation	No	No	No	No	No	No	No	Yes

Action Plan

- We will undergo 3rd & 4th cycles of NAAC re-accreditation in 2019 & 2024 respectively.
- We shall have at least 8 Programs ABET accredited by the 10th Year.
- We shall have at least 23 Programs NBA accredited by the 10th year.
- We are in the final stages of AACSB accreditation for the management school.

4.2.16 The Institution of Eminence Deemed to be University should have reasonably large owned / long term leased (at least thirty years) campus with adequate space for expansion.

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Acreege Space available and future plans	1100 Acres of space is currently available across multiple campuses.	50 acres	50 acres	75 acres	75 acres	100 acres	50 acres	50 acres

Action Plan

The above expansion plans include new campuses like the Delhi NCR (Year 3).

4.2.17 The governance structure of the Institution of Eminence Deemed to be University should be distinct from the governance structure of the Sponsoring Organization.

The governance structure is indeed very distinct from the sponsoring organization and follows international best practices in university governance with utmost professionalism and integrity. Governance is already presented in detail in section IV k. There are some small changes from the existing structure, some new positions are added to ensure accountability of the IoE. The new governance structure will be fully established within two years of start.

4.2.18 The Institution of Eminence Deemed to be University should achieve a student enrolment of at least ten thousand over a period of fifteen years. However, the institutions may project a lower figure as its enrolment target with justification on how that enrolment figure would enable it to become a world class university.

Currently, Amrita has more than 20,200 students enrolled and has already met the required strength.

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
Total Students	20,200	21,770	23,480	25,130	26,940	27,910	32,990	36,590
Increase in New Enrolments per year		1570	1710	1650	1810	970	5080	3600

Action Plan

The above plans also include starting of world class campuses at new locations, like Delhi NCR campus (Year 3)

There will be an increase in enrolment at existing campuses from Year 6 to Year 10 after further developing infrastructure for academics and research.

4.2.19 It should come in the top five hundred of any of the world renowned ranking frameworks (such as the Times Higher Education, World University Rankings or QS or Shanghai's Jiao Tong University) in the first ten years of setting up on being declared as Institution of Eminence and having achieved top five hundred, should consistently improve its ranking to come in the top one hundred eventually over time.

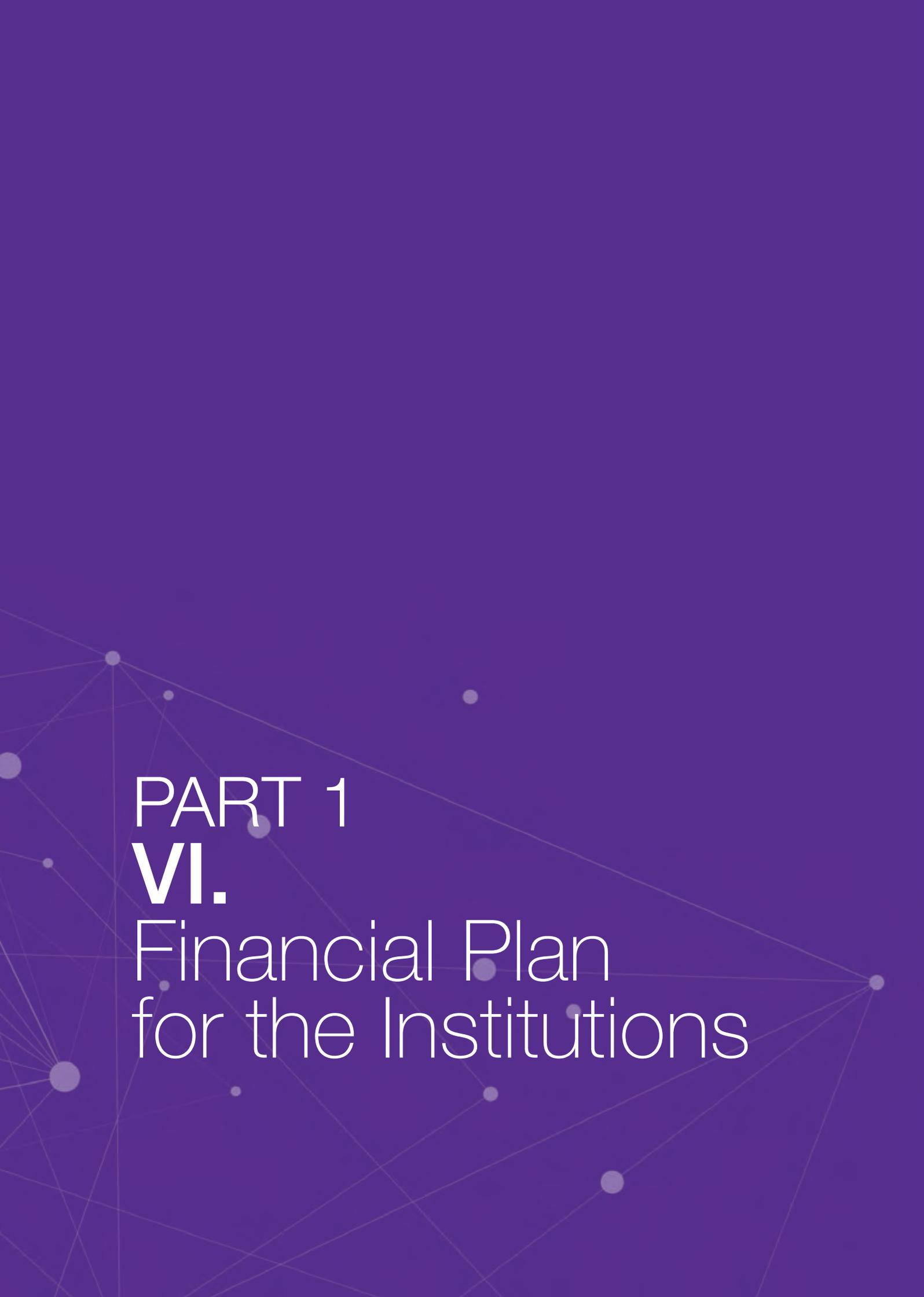
Milestones:

Key Performance Indicators	Current	Years 1 to 5					End of Year 10	End of Year 15
		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5		
NIRF	Top 10	Top 10	Top 10	Top 10	Top 10	Top 10	Top 10	Top 10
Times Higher Education	800-1000	800-1000	800-1000	700-800	700-800	600-700	400-500	300-350

Action Plan

To advance international collaboration and research reputation, Amrita has formally launched a research collaboration with Nature Magazine, one of the highest cited journals in the world, to create high visibility for our cutting edge research published in high impact journals. Nature will host Amrita's research activities on Nature's website, publish its best work on a monthly basis in Nature non-peer reviewed Magazine, and use Nature's resources to connect Amrita's cutting edge research to leading research groups in the world.

- In prior sections, we have already listed action items with regard to increasing research outcome, faculty with Ph.D., international faculty, international collaborations, industry collaborations etc., which are the main metrics by ranking agencies such as Times Higher Education.
- In addition, we will also take targeted steps towards improving our performance in reputation surveys which constitutes a significant component of the ranking metrics by Times Higher Education.
- In particular, we will publish and distribute quarterly university newsletters highlighting interesting recent academic achievements & research contributions, mailed to an international database of academic and industry contacts.
- Collaborative papers with international authors to improve the field weighted citation and reputation parameters.



PART 1

VI.

Financial Plan
for the Institutions

Part 1. VI

Financial Plan for the Institutions

Existing Resources and Expenditure

Existing Revenue Sources (average of last five years) (In Crore)

*Funds Received from Central Govt:	Rs. 37.36 Crores
*Funds Received from State Govt:	Nil
Fees collected from students (Indian):	Rs. 351.77 Crores
Fees collected from foreign students (if any):	Rs. 11.56 Crores
Interest from corpus fund, if any:	Nil
Earnings from consultancy:	Nil
Support from alumni:	Nil
Other earnings from training, workshops, etc:	Nil
Others:	
Hospital collections:	Rs. 232.93 Crores
Contribution from Mata Amritanandamayi Math:	Rs. 43 Crores
Total:	Rs. 676.64 crore

Names of Ministries of Central Govt or the State Govt or UGC or any other Agencies of the Govt from where the funds are being received

Annexure 34, 36, 37 / Page 410 to 454

Details of Existing Resources and Expenditure are Provided:

Annexure 5 / Page 140

Existing Expenditure (average of last five years) (In Crore):

Revenue:	Rs. 566.35 Crores
Capital:	Rs. 69.86 Crores
Total:	Rs. 636.21 Crores

Annexure 6 / Page 141 to 144

Existing Corpus Fund of last five years (year-wise) if any (In Crore):

The current financial plan does not include a corpus fund.

Expected Expenditure

Total Expected Expenditure (In Crore) in first five years:

Revenue:	Rs. 4398.58 Crores
Capital:	Rs. 2772.94 Crores
Total:	Rs. 7171.52 Crores

Year Wise and Item Wise Details are Provided:

Annexure 7 / Page 144 to 146

Average yearly Expenditure (beyond five years) (In Crore):

Revenue:	Rs. 1700.85 Crores
Capital:	Rs. 235 Crores
Total:	1935.Rs. 85 Crores

Details of Calculation are Provided:

Annexure 8 / Page 147

Expected Corpus Fund if any (In Crore):

2021-22- 60 Crores

2026-27- 50 Crores

Expected Resources

Expected Sources (for first five years) (In Crore):

Expected Funds to be received from Central Govt: Rs. 271.50 Cores

Expected Funds to be received from State Govt: Nil

Fees to be collected from domestic students:	Rs. 2867.53 Crores
Fees to be collected from foreign students :	Rs. 125.66 Crores
Interest from corpus fund :	Rs. 19.5 Crores

Earnings from consultancy:	Nil
Support from Alumni:	Nil
Other earnings from training, workshops, etc:	Nil
Others	
Hospital collections:	Rs. 1986.77 Crores
Contribution from Mata Amritanandamayi Math:	Rs. 500 Crores
Total:	Rs. 5770.67 Crores

Annexure 9 / Page 148

Expected yearly Financial Resources (beyond five years) (In Crore):

Expected Funds to be received from Central Govt:	Nil
Expected Funds to be received from State Govt:	Nil
Fees to be collected from domestic students:	Rs. 1170.26 Crores (Average expected fee for the FY 2023 to 2032.)
Fees to be collected from foreign students :	448.50 Crores (Average expected fee for the FY 2023 to 2032)
Interest from corpus fund :	Rs. 6.5 Crores/Year
Earnings from consultancy:	Nil
Support from Alumni:	Nil
Other earnings from training, workshops, etc:	
Others:	
Hospital collections:	Rs. 942.46 Crores
Contribution from Mata Amritanandamayi Math:	Rs. 100 Crores/Year
Total:	Rs. 2264.07 Crores

Annexure 10 / Page 149



PART 2
The Processing
Fee

Part 2. I

Processing Fee (Rs. One Crore)

I. Processing Fee (One Crore)

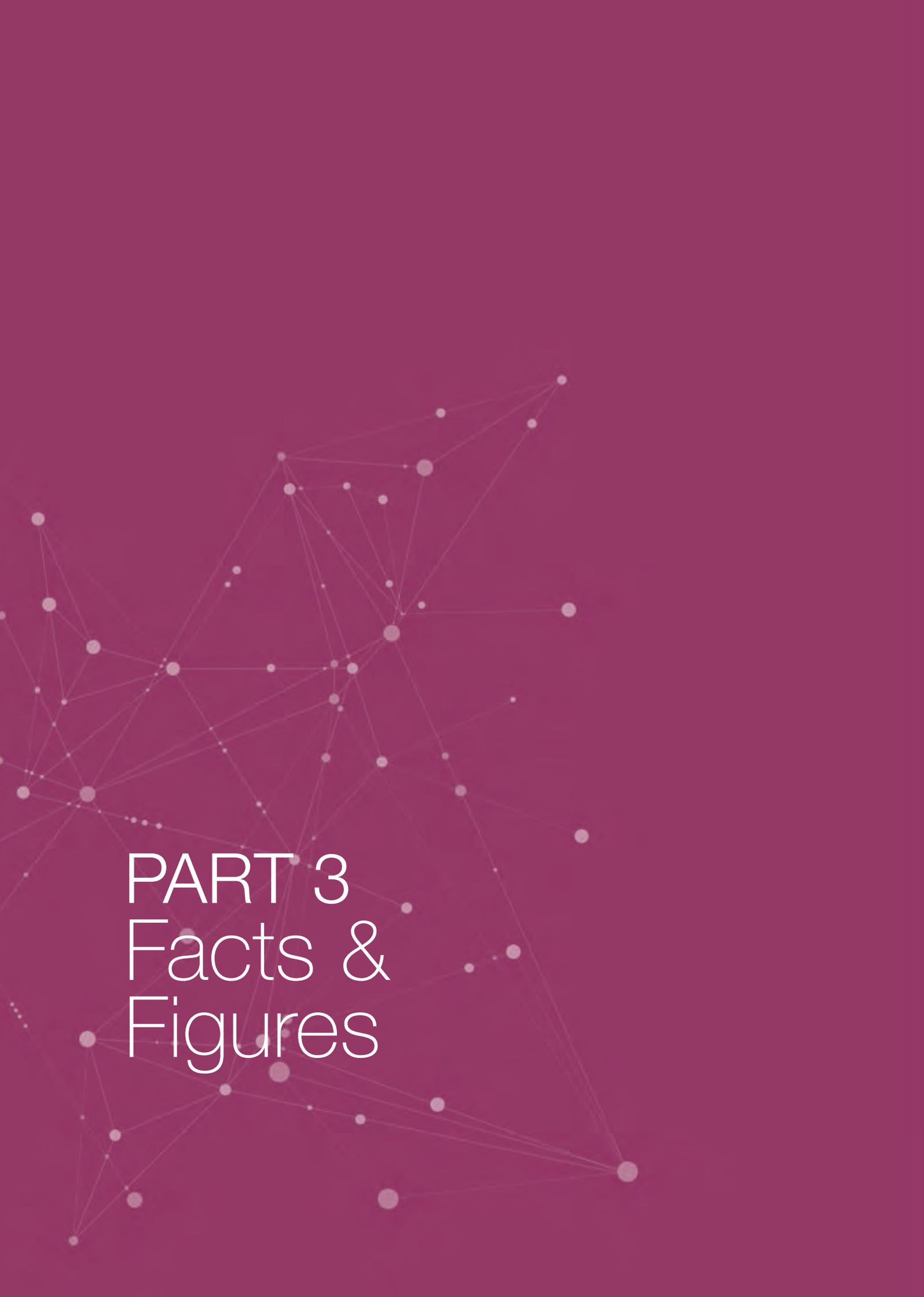
a. The Processing fee to be sent through RTGS/NEFT to the following accounts :

Name of the Bank : Canara Bank
Branch : UGC, New Delhi
Branch Code : 0253
Account No : 8627101002122
IFSC Code : CNRB0008627
MICR No : 110015170

The institute to send the following details about the processing fee sent:

Name of the Institution : Amrita Vishwa Vidyapeetham
Address : Amritanagar P.O.,
Ettimadai, Coimbatore
Tamilnadu - 641112

Name of the Bank : Dhanlaxmi Bank
Branch : Amrita Institute of Technology, Amritanagar
Branch Code : 0253
Account No : 006200900000023
IFSC Code : DLXB000023
Amount : Rs. 1,00,00,000/-
UTR No : DLXBR52017121100500132

A network diagram consisting of numerous nodes (small circles) connected by thin lines, forming a complex web. The nodes are scattered across the page, with a higher density in the lower-left quadrant. The lines are thin and light-colored, creating a subtle pattern against the dark red background.

PART 3 Facts & Figures

BASIC INFORMATION OF THE INSTITUTION / UNIVERSITY

I.A

Name of the Institution

Amrita Vishwa Vidyapeetham

Address of the Institution:

Amritanagar P.O., Ettimadai,
Coimbatore – 641112, Tamil Nadu

I.B

**Location of the Applicant
Institution / University:**

Non-Urban Area

I.C

**Name, Contact No., Email,
Address of Vice-Chancellor
of the Applicant
Institution / University:**

Vice Chancellor

Name: Dr. P. Venkat Rngan
Address: Amrita Vishwa Vidyapeetham
Amritanagar PO, Ettimadai
Coimbatore - 641112, Tamil Nadu
Email: vcoffice@amrita.edu
Mobile: 9488237777
Phone: 0422 2685000
Fax: 04222656274

Registrar

Name: Dr. K. Sankaran
Address: Amrita Vishwa Vidyapeetham
Amritanagar PO, Ettimadai
Coimbatore - 641112, Tamil Nadu
Email: univhq@amrita.edu
Mobile: 7598055275
Phone: 0422 2685000
Fax: 04222656274

I.D

**Act / Notification / MoA Under
Which Existing Institution /
University Established:**

Enclosed MoA during inception of
University in 2003

Annexure 11 / Page 150-152

I.E

Year of Establishment:

2003

I.F

No. of Off Campuses: 04

No. of Off Shore Campuses: Nil

No. of Constituent Unit: N.A.

No. of Constituent Institutions: 15
(14 Schools, 1 PG Centre)

No. of Affiliated Colleges: N.A.

Names and Address of Above Institutions &
Approval of the Government

Annexure 12 / Page 153-154

I.G

**Complete Accreditation status of the
Institutions / Universities, if any, by
National Assessment & Accreditation**

Council (NAAC) / National Board of Accreditation (NBA)

NAAC Accreditation Grade: A
Validity Period: 5 Years

Annexure 13 / Page 155

I.H

Whether the applicant Institution / University is Multi-Disciplinary, Inter Disciplinary or Single Disciplinary?

Multi-Disciplinary Since Inception

Annexure 14 / Page 156



ADMINISTRATIVE STRUCTURE

II.A

Details of Organisation and its Structure:

The details of composition of BoM / Governing Council and other Committees are Provided

Annexure 15 / Page 156

II.B

Governance Structure:

- Composition of Apex Governing Body of Institutions of Eminence
- Governance Structure of proposed Institution of Eminence

- Governance Structure of Sponsoring Organization

Annexure 16 / Page 157-161



EXISTING ACADEMIC DETAILS

III.A

No of School/Centre at UG level: 15
No of Schools/Centre at PG Level: 14
No of Centres / Schools: 15

Names of Departments / Centres / Schools Provided

Annexure 17 / Page 163

III.B

No. of Courses Offered at UG Level/ PG Level:

Level of Courses	No. of Courses / Specialization Offered
UG	41
PG	112
Ph.D	7
DM	10
MCh	9
Integrated	7
M.Phil	5
Diploma	16
Total	207

Names of Courses are Provided

III.C**No. of Courses Offered in****Distance Education:**

We are not offering any courses in Distance Education

III.D**Details of Students Enrolled During the Last Three Years:**

Course Levels	CAY/17-18
UG	13901
PG (Including M.Phil.)	3668
Ph.D. (Including MCh & DM)	981
Integrated	1653
Diploma	46
Total	20249

Course Levels	CAYm1/16-17
UG	13424
PG (Including M.Phil.)	3675
Ph.D. (Including MCh & DM)	849
Integrated	1276
Diploma	58
Total	19282

Course Levels	CAYm2/15-16
UG	12984
PG (Including M.Phil.)	3350
Ph.D. (Including MCh & DM)	651
Integrated	897
Diploma	67
Total	17949

The Course Wise Details Separately for Main Campus and Off-Campuses are Provided

Annexure 20 / Page 170-192

III.E**Details of Foreign Students Enrolled During the Last Three Years:**

Course Levels	CAY/17-18
UG	28
PG (Including M.Phil.)	6
Ph.D. (Including MCh & DM)	9
Other Programs	1
Total	44

Course Levels	CAYm1/16-17
UG	30
PG (Including M.Phil.)	4
Ph.D. (Including MCh & DM)	10
Other Programs	1
Total	45

Course Levels	CAYm2/15-16
UG	36
PG (Including M.Phil.)	4
Ph.D. (Including MCh & DM)	11
Other Programs	1
Total	52

The Course Wise Details Separately for Main Campus and Off-Campuses are Provided

Annexure 21 / Page 193-194

III.F**Total Number of the Existing Faculty as Against Approved Positions (Regular):**

Main Campus:	397
Off-Campus:	1169
Total:	1566

Visiting/Guest/Part-Time: 91

Department-Wise Details of the Faculties (Regular, Ad-Hoc, Part-Time, Guest, Visiting, Contractual Faculty, etc) are Provided:

Annexure 22 / Page 196-201

III.G

Number of the Foreign Faculty Regular, Ad-Hoc, Part-Time, Guest, Visiting, Contractual Faculty, etc):

Main Campus:	100
Off-Campus:	78
Total:	178

Department-Wise Details of the Foreign Faculties (Regular, Ad-Hoc, Part-Time, Guest, Visiting, Contractual Faculty, etc) to be Provided:

Annexure 23a / 202-217

III.H

Department-Wise Details of the Faculties Like Names, Designations, Qualifications, Pay Scale and Experience are Provided:

Annexure 23b / Page 218-369

III.I

Existing Faculty-Student Ratio:

Name of the School	Ratio
Amrita School of Engineering, Coimbatore	1:15
Amrita School of Business, Coimbatore	1:13
Amrita School of Engineering, Amritapuri	1:12
Amrita School of Arts & Sciences, Amritapuri	1:16
Amrita School of Biotechnology, Amritapuri	1:16
Amrita School of Ayurveda, Amritapuri	1:09
Department of Management, Amritapuri	1:10

Amrita School of Engineering, Bangalore	1:17
Department of Management, Bangalore	1:20
Amrita School of Medicine, Kochi	1:04
Amrita College of Nursing, Kochi	1:09
Amrita School of Pharmacy, Kochi	1:15
Amrita School of Dentistry, Kochi	1:06
Amrita School of Arts & Sciences, Kochi	1:23
Amrita Centre for Nanosciences, Kochi	1:04
Department of Management, Kochi	1:10
Amrita School of Arts & Sciences, Mysore	1:26
Amrita School of Education, Mysore	1:06

III.J

Existing Students Admission Policy for Domestic Students:

Annexure 24 / 370-172

III.K

Existing Students Admission Policy for Foreign Students:

Annexure 25 / Page 372

III.L

Existing Faculty Recruitment Policy:

The objective of the faculty recruitment policy of AMRITA is to identify and attract the best available talent available. AMRITA has an open hiring policy; not strictly based on prescribed workload. The hiring process in place envisages a committee of 4 to 5 members of the faculty in every department as well as academic administration. For faculties of medicine and health sciences, we follow the guidelines of the concerned statutory bodies for career progression. For all other faculties, UGC norms are followed.

Annexure 26 / Page 373-377

III.M

Existing Reservations Policy for Students & Faculty:

Annexure 27 / Page 378

III.N

Existing Policy on Providing Scholarship to Meritorious / Needy Students:

Annexure 28 / Page 379



III.A

Institution-Wise and Discipline / Faculty-Wise No. of Books and Journals

Number of Volumes: 252914

Number of Titles: 152530

Number of e-Books: 698727

Number of National Journals: 701

Number of International Journals: 254

Number of e-Journals: 50086

List of Books and Journals are Provided

Annexure 29a Page-379-395

29b / Page 379

III.B

Institution-wise and department-wise list of equipment (More than `25 Lakhs)

Annexure 30 / Page 396-403

III.C

Details of the Modern Information Resources

(Broadband Connectivity, Internet Connections, Wi-Fi Enabled Campus and Other Learning Materials)

Annexure 31 / Page 404-407



IV.A

Academic Achievements by the Faculty for the Last Five Years:

- | | |
|---|------|
| i. No. of Books and Edited Books: | 118 |
| ii. No. of Book Chapters: | 65 |
| iii. No. of SCOPUS Articles in Referred Journals | 5190 |
| iv. No. of Peer-reviewed Monographs: | 70 |
| v. No. of Referred Papers (Non-Scopus and Presentations): | 2643 |
| vi. Other Publications (Monographs): | 70 |
| vii. Other Publications (Working Papers): | 126 |

Number of Publications in Scopus from refereed journals and conferences from 2012-2017

Annexure 32 / Page 408

List of Publications in Scopus from refereed journals and conferences from 2012-2017

Annexure 32 / Page 408

Other Items are Enclosed

Annexure 33,35 / Page 409

IV.B

No. of Honours and Awards in the Last Five Years: 477

Annexure 32/ Page 408

Annexure 33,35 / Page 409

IV.c

Research Grants and Fellowships Received During the Last Five Years

Total Research Funding in the last 5 years: 186.81 Crores

Annexure 34, 36 and 37/ Page 410-454

IV.D

- i. Professional Experience / Activities
- i. Contribution to Professional and / or Public Service
- i. Dissertation Supervised by Regular faculty

Annexure 32, 33, 35/ Page 408, 409

IV.E

Research Projects / Sponsored Research Undertaken During the Last 5 Years

Name of the Faculty / Department/
No. of Research Projects Completed / in Progress, Sponsoring Agency, Funds Received, etc. are Provided

Annexure 36 / Page 410

Annexure 37 / Page 410

Total Research Funding in the Last 5 years: `186.81 Crores

IV.F

Extramural Research Projects Sponsored by Other Agencies (Public and Private) and Implemented by the Institute (s) During Last Five Years

Total Research Funding in the last 5 years `186.81 Crores

Details including names of the Principal Investigator, Sponsoring Agencies and Funds Received

Annexure 36 / Page 410

Annexure 37 / Page 410

IV.G

No. of Patents in Last Five Years:	17
Copyrights in Last Five Years:	02
Transfer of Technology in Last 5 Years:	07

Annexure 38 / Page 455-467

IV.H

National / International Conferences / Seminar / Symposia /Workshop Organized in the Last Five Years:

Numbers (Year Wise):

2012: 9
2013: 6
2014: 15
2015: 12
2016: 17
2017: 6

Annexure 39 / 468-473

IV.I

Other Research Oriented Activities in the Last Five Years:

Annexure 47

IV.J

Details of the Inter-Disciplinary Orientation:

The Centre for Nanosciences and Molecular Medicine (ACNSMM), is an example where the disciplines of medical and biological sciences, materials science, physics, nanotechnology and manufacturing work seamlessly together and has created low cost solutions for cancer, medical diagnostics and tissue engineered medical implants.

The Centre of Biomedical and Molecular Medicine spanning a spectrum of research disciplines in Biotechnology, Bioinformatics and Computational Chemistry and Ayurveda in the fields of Cell Biology, Molecular Biology, Cancer Biology, Cell-line Engineering, Wound Healing, Computational Neuroscience, Neurophysiology, Phytochemistry, Proteomics, RNAi, Analytical Chemistry and Venomics.

The Centre for Wireless Networks and Applications (WNA) is interdisciplinary with embedded, wireless, earth science, comp science, health science, power & energy. A large number of applications with sensors and IoT are in scale disaster management, health and smart communities. The centre has developed and deployed sensors for landslide detection, hydroelectric system, solar micro grid and water distribution systems

Amrita Multi-Modal Applications and Computer Human Interface Labs (AMMACHI)

addresses societal challenges in vocational educational and skill development by building tools from interdisciplinary areas Computer Human Interaction, automation, haptic technologies and applied robotics.

The Amrita Centre for Research in Analytics and Technologies for Education (CREATE) builds large scale solutions to provide inclusive education, personalised learning systems, and intelligent health systems. It has developed interdisciplinary research-based frameworks and methodologies with techniques such as machine learning, natural language processing, artificial intelligence, medical science and data science.

IV.K

No. of Research Linkages of the Institution (s) with the University and Other National and International Agencies:

Annexure 40 / Page 474-591

IV.I

Details of the Full Time Doctoral/ Post-Doctoral Research Programmes:

Annexure 41 / Page 592

V

PROGRAMMES AND ACTIVITIES

VI

MISCELLANEOUS

V.A

Whether Academic Programmes Offer Sufficient Scope for Interdisciplinary Learning and Research?

Yes

Annexure 42 / Page 593

V.B & V.C

Examination Process & Evaluation System

Annexure 43, 44 / Page 594-601

VI.A

Details of Periodic Reviews and Assessments of the Institution/ University by Recognized External Accrediting/Assessment Agencies:

Annexure 45/ Page 602-603

VI.B

Details of Extension Services/ Activities, Societal Engagements, Continuing Education Programmes, Sports and Games, Cultural Activities etc. Undertaken by the Institution/ University

Annexure 46 / Page 604-610

Certificate

This is to certify that all the information provided in this proposal is true to the best of my knowledge and belief.

Signed and Sealed by the Head of the Institution

Amrita Vishwa Vidyapeetham

Amritanagar, Ettimadai, Coimbatore,

Tamil Nadu - 641112

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