Information Brochure on

Flexible Academic Program

लचीला शैक्षणिक पाठ्यक्रम

National Conference on FAP

December 3rd and 4th, 2021 (Fri & Sat)

in Mixed Mode

ऑनलाइन मंच / Online Platform

वेबेक्स / WebEx	यू ट्यूब / YouTube
https://iiita.webex.com / iiita/Lphp?MTID = m9ff9e8459add0bec531 dcced5cadf1 aO	https://www.youtube.com/ channel/UCObB8ahyiSs za8m1 jpbxLA

सम्मेलन स्थल / VENUE

Senate Hall, Admin Building, IIITA Prayagraj, UP, Bharat

प्रशासनिक भवन सभागार, भारतीय सूचना प्रोद्योगिकी संस्थान प्रयागराज, उत्तर प्रदेश, भारत

PATRONs

Hon'ble Shri Atul Kothari
National Secretary, SSUN, New Delhi

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Professor, IIT Kanpur

Hon'ble Prof. Anil D. Sahasrabudhe,
Chairman, AICTE

Program Chair

Hon'ble Prof. P. Nagabhushan
Director, IIITA Prayagraj

Organizing Chair

Dr. Neetesh Purohit
FAP Coordinator
Professor, IIITA

Dr. Vijaishri Tewari
Registrar, IIITA
Professor, IIITA

The proposed post-schooling to Ph.D. Flexible Academic Program (FAP)is designed to allow multiple exits with provisions of re-entry (from the point of exit in the future), along with multi-disciplinary, multi-mode, multi-lingual, lateral entry etc. features of National Education Policy (NEP) 2020. This national conference aims to concretize various business rules related to academics, administration and financial aspects of FAP such that a 4 year pilot run of FAP (initially for technical education) may be conducted through a consortium of institutes/universities w.e.f. the academic year 2022-23. Several renowned institutes/universities, a few key stakeholders and some renowned NEP2020 experts are invited to (preferably) visit IIITA Prayagraj and give inputs for refining FAP. Further, posters/abstracts for effective implementation of NEP2020 in higher education institutes/universities are also invited under 4 different tracks. Some Selected posters/abstracts may be included in the proceedings of the conference. Entire academic fraternity (teachers, researchers, staff, officers, students, parents) is the target audience; they may join the conference through the ONLINE platform. The Shiksha Sanskriti Utthan Nyas (SSUN) New Delhi and IEEE UP section have extended non-financial support to the conference and FAP.

Schedule of Panel Discussions

S. No	Topic	Day	Session	Speakers
1.	**Inaugural Session** **Coordinator:** Prof. Vijaishri Tewari (IIITA), Prof. R. P. Tewari (MNNITA)	Dec 3, 2021	11:00-12:00 Hrs	Invitees*
	TEA	Dec 3, 2021	12:00 – 12:30 Hrs	
2.	**Keynote Address on FAP**	Dec 3, 2021	12:30 – 13:00 Hrs	Prof. Neetesh Purohit
	LUNCH	Dec 3, 2021	13:00 - 14:30 Hrs	
3.	**PANEL-1:** Entry-Exit Norms, offered specializations and Curriculum under FAP **Coordinator:** Dr. Suneel Yadav (IIITA), Prof. Aditya Trivedi (IIITMG), Dr. Satish Kumar Singh (IIITA)	Dec 3, 2021	14:30 - 16:30 Hrs	Prime Mover* Panel Members* Moderator*
	TEA	Dec 3, 2021	16:30 - 17:00 Hrs	
4.	**PANEL-2:** Comprehensive Academic Norms and Rule Book for students enrolled under FAP **Coordinator:** Dr. Ashutosh Singh (IIITA), Dr. Pradeep Goyal (DTU), Dr. Manish Kumar (IIITA)	Dec 3, 2021	17:00 - 19:00 Hrs	Prime Mover* Panel Members* Moderator*
5.	**PANEL-3:** The governing principles of the FAP Consortium **Coordinator:** Dr. Vineet Tiwari (IIITA), Prof. Unnat P. Pandit (JNU)	Dec 4, 2021	11:00 - 13:00 Hrs	Prime Mover* Panel Members* Moderator*
	LUNCH	Dec 4, 2021	13:00 - 14:30 Hrs	
6.	**PANEL-4:** Miscellaneous Courses in FAP **Coordinator:** Prof. Vijaishri Tewari (IIITA) Dr. Utkarsh Goel (IIITA) and Dr. Purnendu Mishra, State Coordinator, SSUN,	Dec 4, 2021	14:30 – 15:30 Hrs	Prime Mover* Panel Members* Moderator*
7.	**PANEL-5:** Discussions on the condensed recommendations of the panel 1, 2 and 3 above and MOU. **Coordinator:** Prof. Pritish Varadwaj (IIITA)	Dec 4, 2021	15:30 - 17:30 Hrs	Panel Members* Moderator*
	TEA	Dec 4, 2021	17:30 - 18:00 Hrs	
8.	**Closing Ceremony** **Coordinator:** Prof. Madhvendra Mishra (IIITA), Dr S. Venkatesan (IIITA)	Dec 4, 2021	18:00 - 19:00 Hrs	Invitees*
9.	DINNER	Dec 4, 2021	19:00 Onwards	All participants

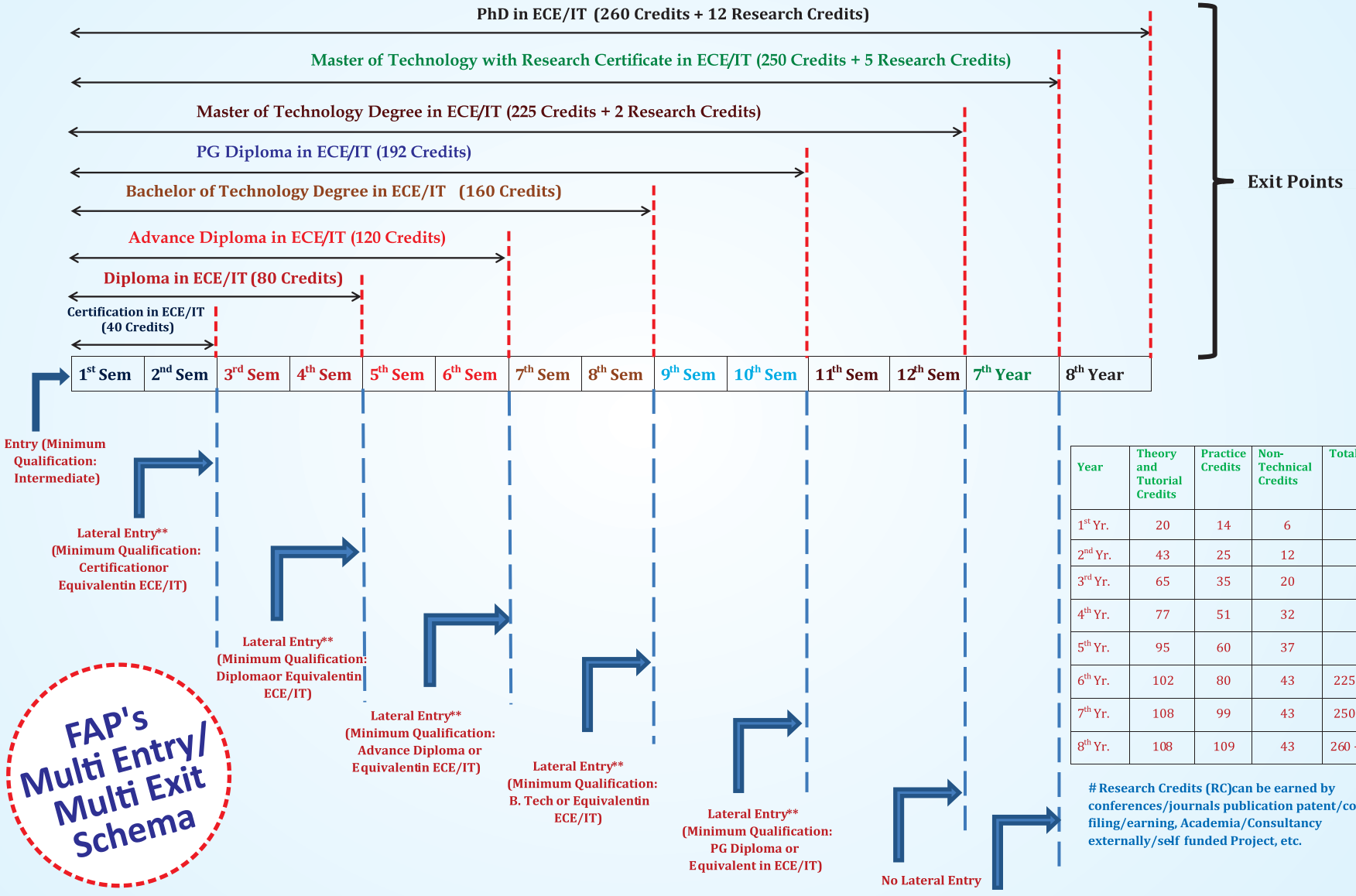
Definitions

- **"Participating Institutes/University",** shall refer to all those institutes who will sign MOU with IIITA (Or its company) for offering some courses
- **"Consortium"** the group of all participating institutes/universities is referred as consortium.
- **"Degree"** shall refer to the Certificate/Diploma/Degree for FAP.
- **"Exit Option"** refers to the privilege available to the candidate as spelt out in the ordinance
- **"MultiDisciplinary"** refers to limited freedom offered to choose courses from various disciplines
- **"MultiEntry"** refers to the freedom offered to join the program at different levels
- **"MultiExit"** refers to freedom to leave the program with different levels
- **"MultiMode"** refers to limited freedom offered to choose the ONLINE or in campus modes of studying a particular course.
- **"MultiLingual"** refers to limited freedom offered to choose the language of studying a particular course e.g. physics course in Hindi, Chemistry in Marathi, Mathematics in Telugu, Electrical Engineering in Kannada, Communication Engineering in Tamil, etc.
- **"MultiInstitute"** refers to limited freedom offered to choose the ONLINE or in campus modes of studying a particular course from any participating institute/university.
- **"Miscellaneous Credit"** means Humanities/ Managements, etc field's courses WHICH may be opted from the miscellaneous basket.
- **"Research Credits (RC)"** can be earned by conferences/ journals publication patent/ copyright Filing/earning, Academia/ Consultancy externally/ self-funded Project, Adding experiments to lab etc. A detailed guidelines will be prepared for mentioning fine details of research points associated with these activities OR the research point scheme of NITs used for faculty recruitment may be adopted.
- **"Theory credit"** means the theoretical evaluation of courses.
- **"Practical credit"** means the laboratory-based courses and practical based evaluation which includes project, industrial training, etc.

Flexible Academic Program "FAP"

WAYS OF IMPLEMENTATION

1 - Full Implementation | 2- Restricted Implementation | 3- Top-Up Implementation



FAP's Multi Entry/ Multi Exit Schema

Year	Theory and Tutorial Credits	Practice Credits	Non-Technical Credits	Total Credits
1st Yr.	20	14	6	40
2nd Yr.	43	25	12	80
3rd Yr.	65	35	20	120
4th Yr.	77	51	32	160
5th Yr.	95	60	37	192
6th Yr.	102	80	43	225 + 2RC#
7th Yr.	108	99	43	250 + 5RC#
8th Yr.	108	109	43	260 + 12RC#

Research Credits (RC)can be earned by conferences/journals publication patent/copyright filing/earning, Academia/Consultancy externally/self funded Project, etc.

**At the Lateral Entry Stage, additional credits may be assigned to the students

Multi-Institute, Multi-Discipline, Multi-Entry, Multi-Exit, Multi-Mode, Multi-Language, Flexible/Forcing Options

Three Steps of Multi-institute FAP Implementation

(In depth discussions on the above said (and other possible implementations) will be held in the Panel-5)

Restricted FAP

All PIs should independently start FAP (with exactly same curriculum, may be a modified version of the proposed one in Panel-1).

Either currently available number of CS/IT/ECE seats may be partitioned OR fresh seats may be introduced as per the priority of individual institute.

Intake to individual institute will be held as per their exiting norms, and they will award the degree to students admitted in their institutes.

Limited flexibilities e.g. temporary transfer to other institutes offering FAP (returning back to the parent institute), multimode, multilingual etc. may be offered to students admitted in this program as may be decided by the respective Senate.

The FAP consortium will coordinate these activities and provide centralized support for transparent implementation, e.g. JoSAA functionalities may be extended for conducting transfer rounds after completion of 2nd, 4th, 6th, 8th, 10th Semesters.

Top-UP FAP

Some provisions of FAP may be toped up over the existing programs in IT/CS/ECE.

Students may be allowed to transfer in both directions depending upon their performances (in entrance exam and afterwards), and against the vacant seats.

Transfers will be permanent. FAP consortium may coordinate.

Full FAP

The students are admitted in a Virtual Institution (VI). It will issue temporary VISAs to them for visiting a particular institute in a semester. The students will return back to VI after expiration of the VISA.

The VI will award the certificate/degree at the exit points.

Independent FAP Consortiums

There may be 2 independent FAP consortiums with wild card (including forced exit) inter-consortium movement mechanism e.g. partitioned GATE syllabus and section wise scoring.

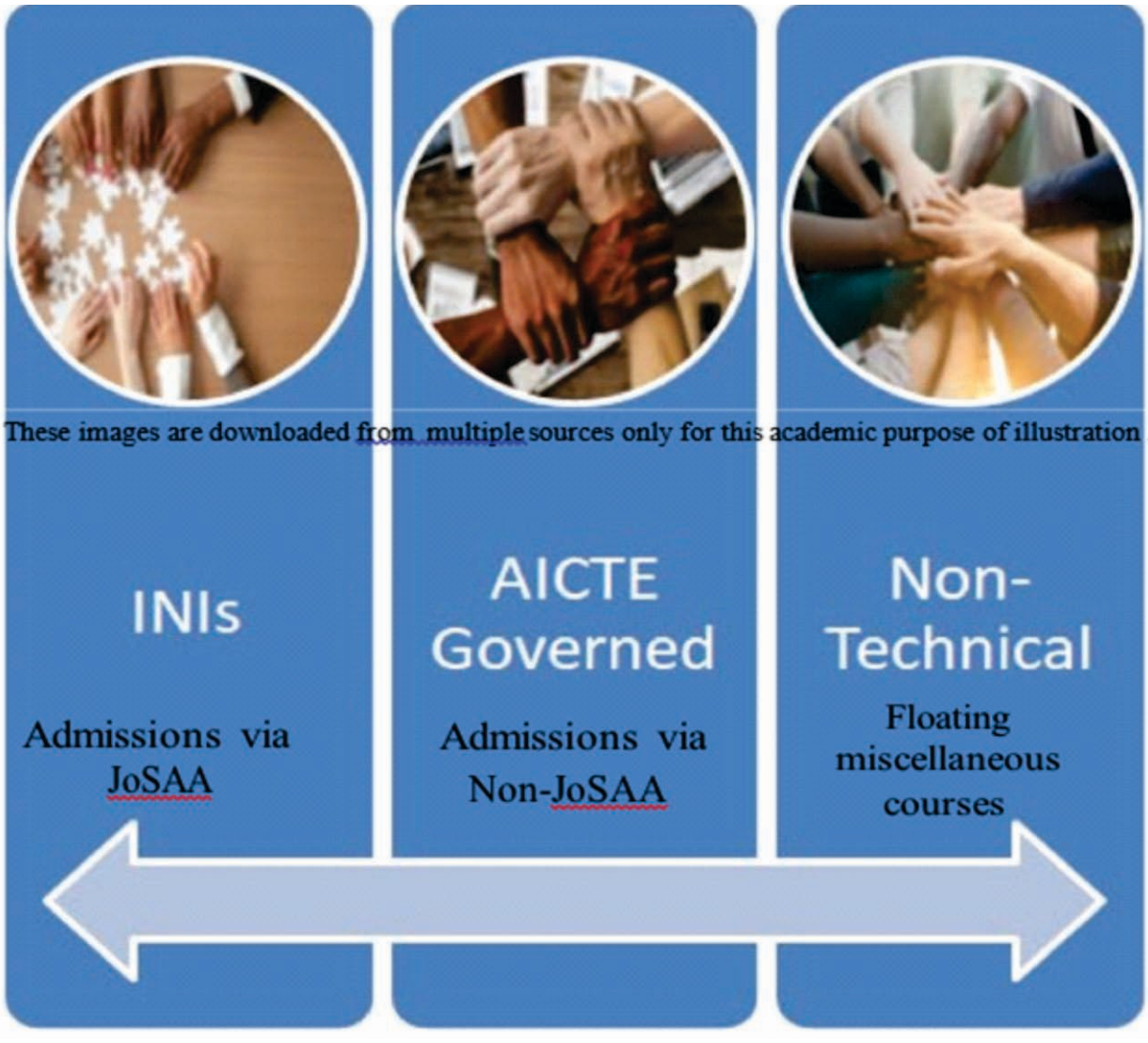
Internally the INIs consortium will have two wings as 'JEE-Advance Institutes' and 'JEE Institutes'. Intra-consortium movement may also be conditional and may be differently defined by various PIs.

Renowned Non-Technical

Institutes/Universities may also be PIs enabling their teachers to float courses for FAP students under miscellaneous baskets. Moreover, these institutes may plan their own FAP programs through their own consortium.

Technical FAP to Other discipline FAP movement may also be provisioned.

In pilot run there may be just one consortium.



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Full FAP Implementation

(The Ministry of Education, GoI needs to take some initial actions)

- **Along with the proceedings of this conference, IIITA will send the proposal to MOE with a request of selecting a few institutes, obtain their consent, and formally constitute the VI for conducting the pilot run of full FAP. Also, it should give the power of conferring degrees to VI through the Act of Parliament or as may be decided by the MOE.**
- **The MOE may designate any PI as VI too for conducting the pilot run, and suitably name the VI. Also, it may ask NIC to build the backbone software for smoothly running FAP through the VI.**
- **The VI will have its own BOG, Senate and other bodies consisting of a few Professors working at PIs (as nominated by respective Director/VC), Nominees of MOE Govt. of India, AICTE, UGC, NIC, etc. These bodies will function as they work in institutes of national importance (INIs).**
- **The VI will designate one of the PI as a coordinating institute for a particular batch of a particular specialization transferring almost all its responsibilities for that batch i.e. VI works in distributed manner.**
- **The VI may have following participating institutes (PIs)**
- **Institutes of National Importance (12 in pilot run e.g. 3 IITs, 4 NITs, 5 IIITs (CFTI + PPP)**
- **UTDs owned by different states technical universities (2 in pilot run e.g. IET Lucknow of AKTU)**
- **Renowned Private University (1 in pilot run)**
- **Non-Technical reputed institute/Universities (3 in pilot run e.g. any one IIM, GBPSSI, DU/JNU etc.)**

In depth discussions on the pilot run will be held in the Panel-5. The Main features of FAP may be discussed in Panel-1 and 2.

Full FAP in Pilot Run

Offered specializations:

8-Yr Flexible Academic Program (FAP) in IT

8-Yr Flexible Academic Program (FAP) in ECE

The VI should may intake 150 students in each of the above 2 specialization i.e. total 300 students may be admitted through JEE Mains.

At any point of time the IITs (and other institutes too) may define additional eligibility conditions for getting VISA, e.g. Only those students will get VISAs to IITs who have scored above a threshold in the JEE Advance of respective batch (e.g. not below 1000 lower than the last admission). May allow entry to a student who has completed all previous courses from a INI or those institutes which are under 100 NIRF ranking, etc.

The respective PI will either grade the students as per VIs standard norms or as per its own norms, the VI will suitably map these grades to a uniform VI grades through suitable conversion formula. (Something equivalent to the Currency Conversion Concept)

Main Features of the FAP Curriculum

All technical courses have been reorganized and their syllabus has been redefined to ensure that there should be completeness (in some sense) at each exit point.

In each semester 2 credits are required to be completed from miscellaneous basket and another 1 credit by sports or community service. For NCC/NSS type courses these credits may be combined into 3 credit courses.

The model tested in the 'Orientation Camp' for systematically organizing the community services through the pre recognized organizations may be adopted.

Instead of individual elective subjects complete modules of specialized streams are proposed to be offered in 6th and 7th sem. The graduating student will have skills of 2 such specialized modules.

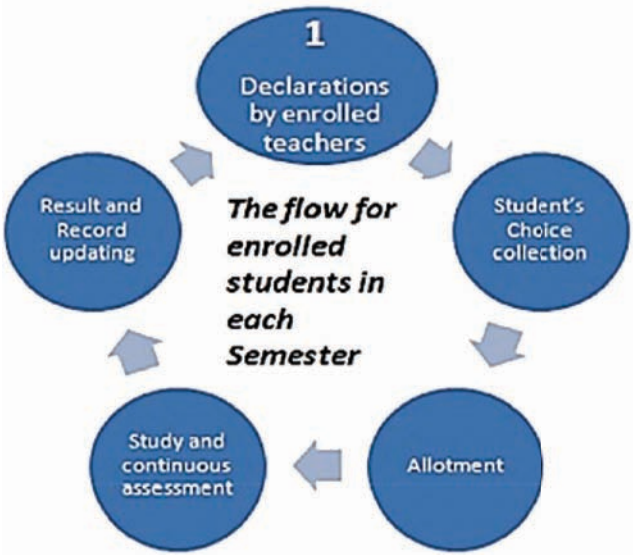
If a student wants to continue study in one of these two streams then he should move ahead through MTech by research mode. However, if someone wants to change the stream at this stage then he/she needs to adopt the standard curriculum.

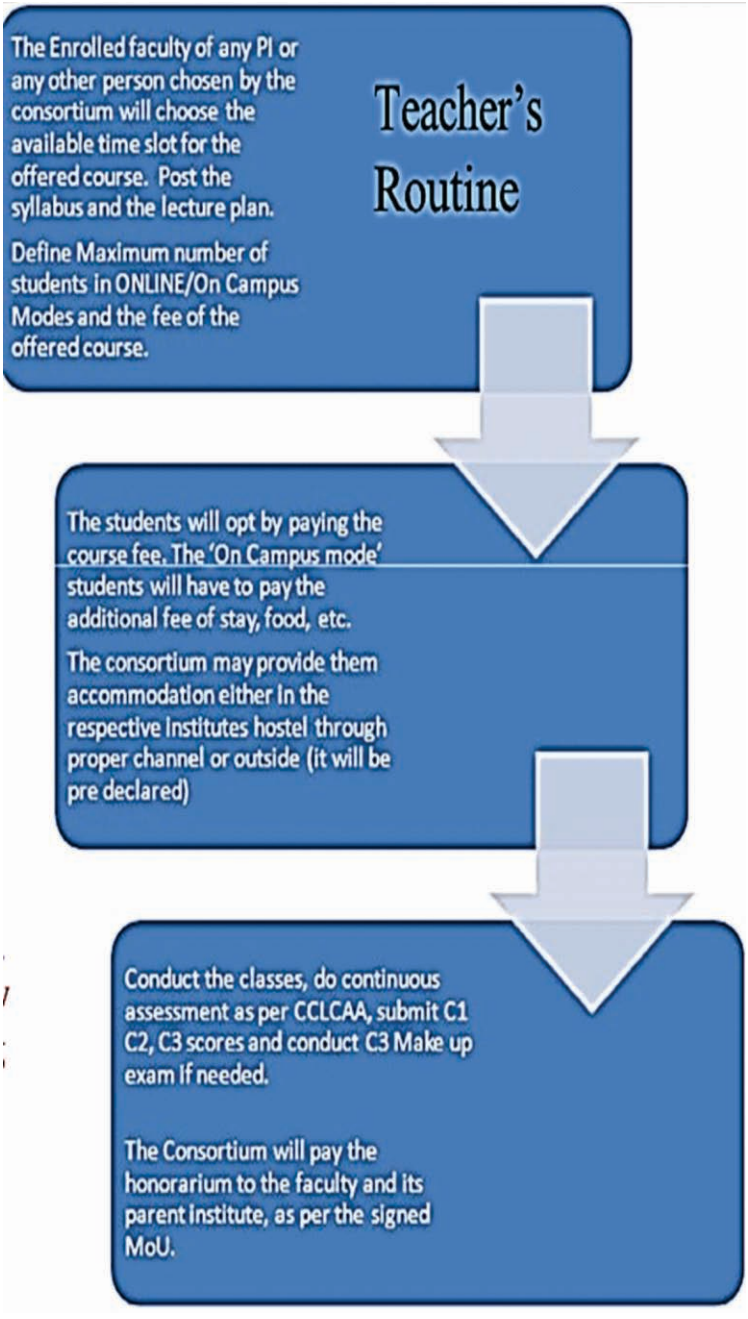
In 7th and 8th Year instead of semester system, yearly system will be followed. Further no lateral entry is allowed at this stage.

At any point of lateral entry, depending upon the previous credits earned, and the time gap, a few more credits may be asked to be completed.

Semester's Routines
(For teachers/ students/ record keeping)

(Detailed guidelines for students, faculty and record keeping will be discussed in the Panel-2)





Targeted Skills
(At each exit point of FAP)

Exit Points	FAP in ECE	FAP in IT
1st Yr	Relevant theory with small electrical/electronic/digital circuits fabrication on PCB. Basic PC/Web tools and programming. Professional letter writing.	Knowledge in Computer Basics including unix commands, softwares and hardwares, basic programming skills, realize the networking aspects of computers and can fabrication manage the IT infrastructure of any organization. small-scale innovative IT-Enabled and electronic products, IoTs and small-embedded products. good communication skills
2nd Yr	Relevant Theory with circuit design and fabrication for wider applications. PC/Mobile assembling and troubleshooting.	Strong foundations in Information Technology in terms of object oriented programming, complexity analysis, operating system, computer and communication manage the databases for the organizations. front-end and back-end solutions by integrating with databases. Start any digital marketing industry.
3rd Yr	Relevant Theory with SMT fabrication. RF and communication-based systems design and testing. Managerial Skills.	Good hands-on experience with full stack development and will be able to develop the full fledged projects of webservices. solutions for real-world problems using AI and ML tools for different data, including Images.
4th Yr	Two specialized domain training with relevant in depth theory, planning and building big implementation projects. Entrepreneurship, Banking, etc.	Develop efficient IT solutions for real-world applications. The certification course 4th year can be in a specialization such as (AI&ML, Cybersecurity, Data Science, based on the elective courses that specialization Entrepreneurship, Banking, etc.
5th Yr	Research Methodology, up to date research and development status of a narrower specialization, Research paper writing skills.	
6th Yr	Research problem formulation skills in the chosen narrower specialized field and relevant software/hardware tools used in the research, research projects writing.	
7th Yr	Critical Research, Reviewing the peer's research works, Sharpened experimental and Analytical skills in the chosen field of research.	
8th Yr	Reputed Journal Paper Publications, Patent Filing, Thesis Writing, Consultancy projects.	

Detailed targeted life skills planned to be introduced through the miscellaneous basket in the curriculum for FAP in IT and FAP in ECE will be discussed in the Panel-4

VI's Financial Model

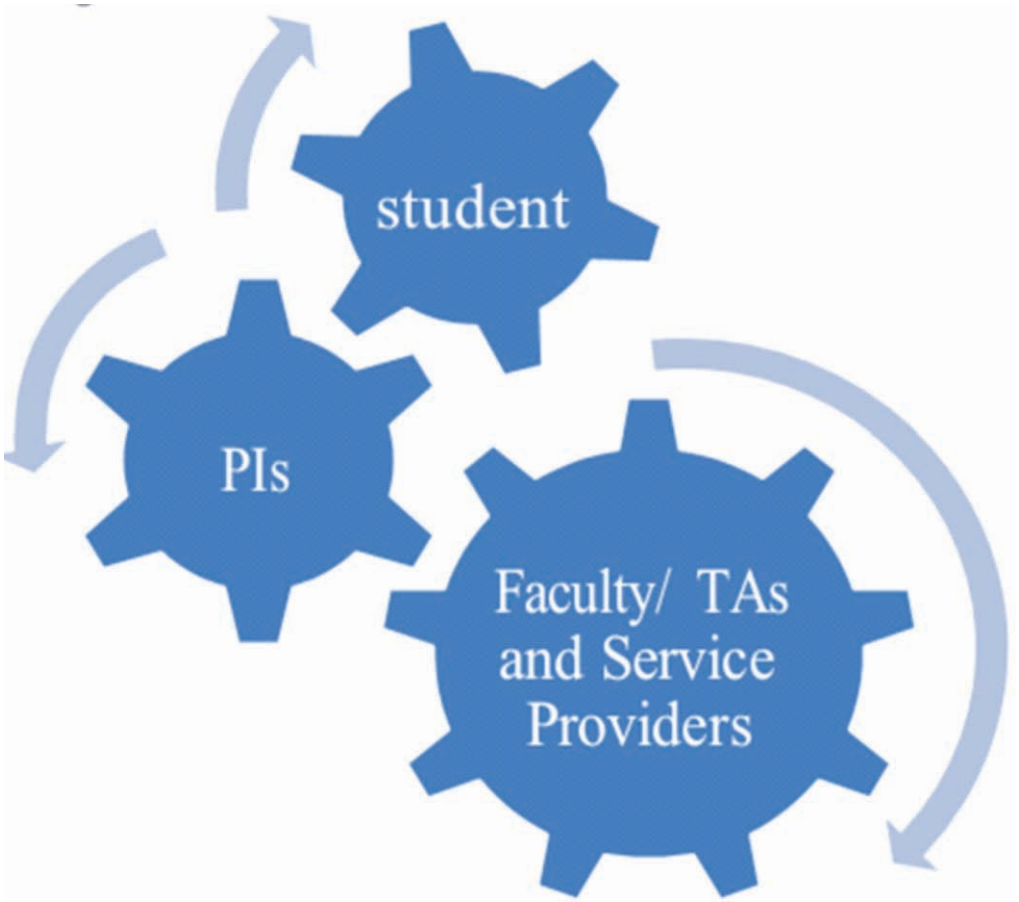
(Detailed financial and non-financial issues as may be relevant to the FAP consortium will be discussed in the Panel-3)

Income Sources -

- Grants from Govt. /Autonomous Bodies.
- Donations from industries/philanthropists.
- Course Fee collected from the enrolled students.

Expenditures -

- Development, Operation and Maintenance costs of the backbone software.
- Honorarium to Teachers, TA's, Office bearers of VI, etc. persons.
- Service charges to Coordinating Institute(s)
- Overheads to the institutes whose teachers are offering courses in FAP
- Advertisement, and other miscellaneous costs.



In depth discussions on the PI's responsibilities will be held in the Panel-5

Primary responsibilities of the PIs

Motivating its faculty members to offer courses for students enrolled under FAP. ONLINE, ON Campus modes, Offered Language in which they will teach the course, per student fee (from 0 to some upper limit as may be fixed by the VI), the minimum and maximum number of students for which they will run the course, etc. The honorarium and institute's overhead will be in proportion to the number of students taught by them.

Notifying to VI the maximum number of students which may be accommodated in their campus. (the hostel, mess etc. charges may be collected extra from the students reported to their campus). Notifying to VI about the vacancy created at their institute at any • level (of the relevant programs offered through VI), for whatsoever reason, allowing the VI to fill it through FAP Top-UP scheme.

Admit the students carrying the VISA issued by VI and • release them after the semester is over. Ensuring that the results should be submitted before the deadlines defined by the VI.

Allowing the VI to use its name/logo in advertisements, mark sheets/transcripts etc. purposes.

Designate a faculty as FAP Coordinator, who is the part of VI and may be the point of communication for the respective institute.

Any other responsibility as may be assigned by the VI.

Primary responsibilities of the VI

All Participating Institutes (PIs) are the Study Centers of the Virtual Institute (VI). Sufficient seed money needs to be made available to VI by either MOE or the PIs should contribute

VI acts as allocator i.e. the VI shall transparently issue VISAs to its students with one semester validity enabling them to visit a particular PI in a particular semester. The students will return back to VI after expiration of the VISA.

VI acts as Academic Bank of Credits (ABC), entire book keeping and tracking to be executed by the VI.

VI needs to ensure that no student should remain unassigned to any institute after any round of allocation. A few PIs needs to admit them on rotation basis.

VI takes care of campus placement and other promotional activities for its students and other stakeholders.

Any other tasks as may be decided by its BOG or MOE.

Panel – 1

Topic: Entry-Exit Norms, offered specializations and Curriculum under FAP

Coordinator & Prime Mover

Dr. Suneel Yadav
(IIITA)

Coordinator & Moderator

Prof. Aditya Trivedi
(IIITMG)

Coordinator

Dr. Satish Singh
(IIITA)

MEMBERS IN PANEL

Prof. Rajat Moona
Director IIT Bhilai

Dr. (Mrs) Pankaj Mittal
General Secretary AIU

Prof. Lalit Awasthi
Director NIT Jalandhar

Prof. Anupam Shukla
Director IIIT Pune

Prof. Kanchan Chowdhury
IITKGP

Prof. Rintu Banerjee
IITKGP

Prof Arvind Choubey
Director IIITB

Prof. Pankaj Jalote
IITD

Prof. Shekhar Verma
IIIITA

Prof. O.P.Vyas
IIITA

Prof. Anupam
IIITA

Panel – 2

Topic: Comprehensive Academic norms and Rule book for students enrolled under FAP

Coordinator & Prime Mover

Dr. Ashutosh Singh
(IIITA)

Coordinator & Moderator

Prof. Vimal Kumar
(IIITK)

Coordinator

Dr. Manish Kumar
(IIITA)

MEMBERS IN PANEL

Sl. No.	Panelist Name	Designation/Institute	Photo
	**Prof. Ajit Chaturvedi**	Director IIT Roorkee	
	**Prof. V Rajakumar**	Director IIT Bhubaneshwar	
	**Prof. K K Shukla**	Director NIT Jamshedpur	
	**Prof. Ganesan**	Director IIIT Sricity	
	**Prof. Vineet Kansal**	VC AKTU Lucknow	
	**Prof. Kondekar**	IIITDM Jabalpur	
	**Dr. Mohit Gambhir**	Director, MoE Innovation Cell, GoI	
	**Dr. Pradeep Goyal**	DTU	
	**Prof. T. Lahiri**	IIIITA	
	**Prof. G.C. Nandi**	IIITA	

Panel – 3

Topic: The Governing principles of the FAP consortium

Coordinator
& Prime Mover

Dr. Vineet Tiwari
(IIITA)

Coordinator
& Moderator

Prof. Pritha Chandra
(IIITD)

MEMBERS IN PANEL

Prof. Neelesh Kumar Jain
Director IIT Indore

Dr. Alok Mishra
DDG NITI Aayog

Prof. Rajeev Tripathi
Director MNNITA, Prayagraj

Prof. P K Mishra
VC JTU Ranchi

Prof. Unnat P. Pandit
JNU New Delhi

Prof. Swati Patankar
IITB

Prof. Bhushan Patwardhan
Former Vice Chairman UGC

Prof. Vrijendra Singh
IIITA

Prof. Pavan Chakraborty
IIIITA

Dr. K P Singh
IIITA

Dr. Ashutosh Mishra
IIITA

Panel – 4

Topic: Miscellaneous Courses in FAP

Coordinator & Moderator

Prof. Vijaishri Tiwari
Registrar, IIITA

Prime Mover

Swami Atmashraddhananda Ji

Coordinator

Dr. Purnendu Mishra
State Coordinator, SSUN

Coordinator

Dr. Utkarsh Goel
IIITA

MEMBERS IN PANEL

Prof. B.N. Tiwari
Director, GBPSSI Prayagraj

Prof. R P Tewari
MNNITA

Dr Saurabh Mishra
DSVV Haridwar

Prof. Madhvendra Mishra
IIITA

Prof. Ranjit Singh
IIITA

Prof. Vrishabh Prasad Jain
Director, MGAHVV
Vardha

Shri Ashok Mehta
Sr. Advocate,
High Court, Allahabad

Panel – 5

Topic: Discussions on the condensed recommendations of the panel 1, 2 and 3 above and MOU

Prime Mover

Prof. Neetesh Purohit
Coordinator - FAP

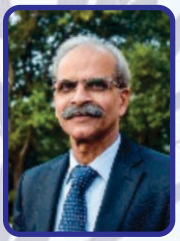
Coordinator & Moderator

Prof. Pritish Varadwaj
IIITA

MEMBERS IN PANEL

Prof. Anil Sahastrabuddhe
Chairman AICTE

Prof. P. Nagabhushan
Director IIITA Prayagraj



Prof. V K Tewari
Director IIT Kharagpur

Prof. T N Singh
Director IIT Patna

Prof. Prasad Patnayak
IITM (Chairman GATE2021)

Prof. P K Jain
Director NIT Patna

Prof U B Desai
IIT Hydrabad

Prof. Naveen Chandra Seth
VC, GTU

Prof. N.V. Ramana Rao
Director, NIT Warangal

Dr. Vijay Chaurasiya
IIITA

Syllabus Structure (ECE)

Total Credit: 40

Semester 1			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Applied Mathematics	Core	3	
2	Applied Physics	Core	4	2–1–1
3	Electronics Devices and Circuits	Core	4	2–1–1
4	Electrical Engineering	Core	4	2–1–1
5	Non-Technical Subject*	Core	2	1-1-0
6	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
7	Electronics Workshop	Core	2	0–0–2
Semester 2			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Basics of Information Technology	Core	3	1–1–1
2	Introduction to Programming	Core	3	0–1–2
3	Digital System Design	Core	4	2–1–1
4	Electronics Measurement & Instrumentation	Core	3	1–1–1
5	Non-Technical Subject from the Baskets*	Core	2	1-1-0
6	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
7	Mini Project-I	Core	4	0–0–4

*Non-technical subject should be chosen from the different baskets
#Community Services through a FAP recognized organization

At the end of 1st year, students will have the following skill set:

1. Relevant theory with small electrical/electronic/digital circuits' fabrication on PCB
2. Basic PC/Web tools and programming
3. Professional Letter writing

Total Credit: 80

Semester 3			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Micro Processor Interface and Programming	Core	3	1–1–1
2	Continuous and Discrete Signals and Systems	Core	4	2–1–1
3	Electromagnetic Field and Waves	Core	3	2–1–0
4	Analog Electronics	Core	4	2–1–1
5	Data Structures	Core	3	1–1–1
6	Non-Technical Subject from the Baskets*	Core	2	1-1-0
7	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 4			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Digital Communications	Core	4	2–1–1
2	Integrated Circuit Technology	Core	3	2–1–0
3	Antenna and Wave Propagation	Core	3	2–0–1
4	Control Systems	Core	3	1–1–1
5	Non-Technical Subject from the Baskets*	Core	2	1-1-0
6	Sports/Arts/Languages/Community Services#	Co re	1	0-0-1
7	Mini Project-II	Core	4	0–0–4

At the end of 2nd year, students will have the following skill set:

1. Relevant theory with circuit design and
2. Fabrication for wider applications. PC/Mobile
3. Assembling and troubleshooting

Total Credit: 120

Semester 5			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Power Electronics	Core	2	1–0–1
2	Digital IC Design	Core	3	2–0–1
3	Digital Signal Processing	Core	3	2–0–1
4	Computer Networks	Co re	3	1–1–1
5	Microwave Engineering	Core	4	2–1–1
6	SMT Workshop (or equivalent)		1	0-0-1
7	Non-Technical Subject from the Baskets*	Core	3	2-1-0
8	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 6			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
	Any one specialized module (with 3 subjects + 1 project/ Independent Study/ Industrial Project, etc.) may be chosen in the fields of	Core	16	8-4-4
1	Module-1: Wireless Communication Sys tems			
2	Module-2: RF and Microwave Engineering			
3	Module-3: Data Science			
4	Module-4: Embedded Systems			
5	Any other as may be floated by PI			
6	Non-Technical Subject from the Baskets*	Core	3	2-1-0
7	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

At the end of 3rd year, students will have the following skill set:

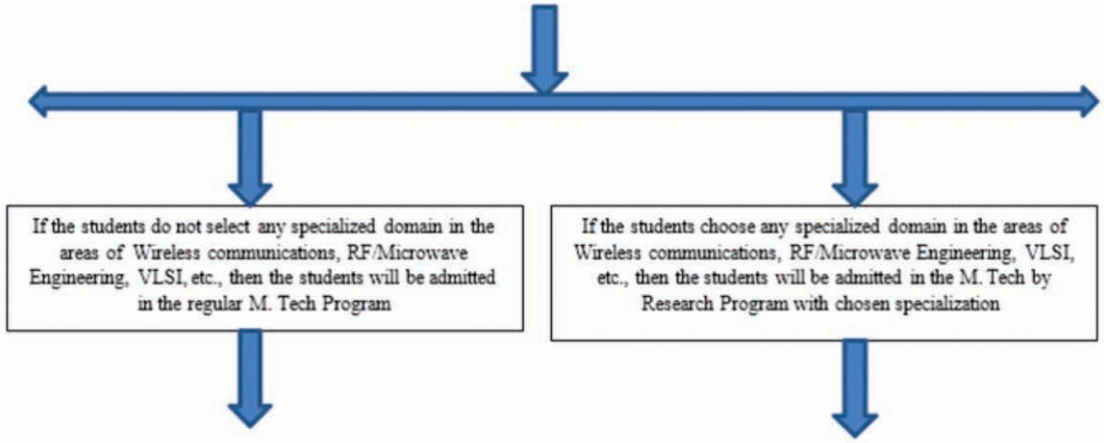
1. Relevant Theory with SMT fabrication
2. RF and Communication based systems design and testing
3. Managerial skills.

Total Credit: 160

Semester 7			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
	Any one specialized module (with 3 subjects + 1 project/ Independent Study/ Industrial Project, etc.) may be chosen in the fields of	Core	16	8-4-4
1	Module-1: VLSI Design and fabrication			
2	Module-2: Cyber Physical Systems			
3	Module-3: Recent Wireless Communication Technologies			
4	Module-4: Photonics			
5	Any other as may be floated by PI			
6	Non-Technical Subject from the Baskets*	Core	3	2-1-0
7	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 8			**Total Credit: 20**	
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Non-Technical Subject from the Baskets* (two courses may be offer ed of 3 credits each with proportion 2-1-0)	Core	6	4-2-0
2	Sports/Arts/Languages/Community Services#	Core	2	0-0-2
3	Major Project (Thesis)	Core	12	0–0–12

At the end of 4th year, students will have the following skill set:

1. Students will be able to develop efficient ECE solutions for real-world applications
2. Planning and building big implementation projects.
3. Entrepreneurship, etc.



Total Credit: 192

Semester 9			Total Credit: 20	
S. No.	Course Name	Core/ Elective	Credit	L-T-P
1	Advance Mathematics	Core	3	2–1–0
2	Programming for Engineering Applications	Core	3	0–1–2
3	Introduction to Microelectronics	Core	4	3–0–1
4	Advance Communication Engineering	Core	3	2–1–0
5	Digital System Design	Core	4	2–1–1
6	Non-Technical Subject from the Baskets*	Core	2	1-1-0
7	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 10			**Total Credit: 12**	
1	Elective-1	Core	3	2–1–0
2	Elective-2	Core	3	2–0–1
3	Non-Technical Subject from the Baskets* OR Sports/Arts/Languages/Community Services#	Core	2	1-1-0
4	Major Project-I	Core	4	0–0–4

Total Credit: 192

Semester 9			Total Credit: 20	
S. No.	Course Name	Core/ Elective	Credit	L-T-P
1	As decided by the Faculty Supervisor according to the specialized domain		17	9-4-4
2	Non-Technical Subject from the Baskets*	Core	2	1-1-0
3	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 10			**Total Credit: 12**	
S. No.	Course Name	Core/ Elective	Credit	L-T-P
1	As decided by the Faculty Supervisor according to the specialized domain		10	4-1-5
2	Non-Technical Subject from the Baskets* OR Sports/Arts/Languages/Community Services#	Core	2	1-1-0

At the end of 5th year, students will have the following skill set:

1. Research Methodology
2. Up to date research and development status of a narrower specialization
3. Research paper writing skills

Total Credits: 225 + 2 Research Credits (RC)

Semester 11			Total Credit: 18	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1	Elective -1	Elective	3	2-1-0
2	Research Methodology	Core	3	2-1-0
3	Independent Study	Elective	3	0-1-2
4	Major Project-II	Core	6	0-0-6
5	Non-Technical Subject from the Baskets*	Core	2	1-1-0
6	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 12			**Total Credit: 15**	
1	Thesis	Core	12	0–0–12
2	Non-Technical Subject from the Baskets*	Core	2	1-1-0
3	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

2RC can be earned by conferences/journals publication patent/copyright filing/earning, Academia/C onsultancy externally/self-funded Project, etc., during the academic year.

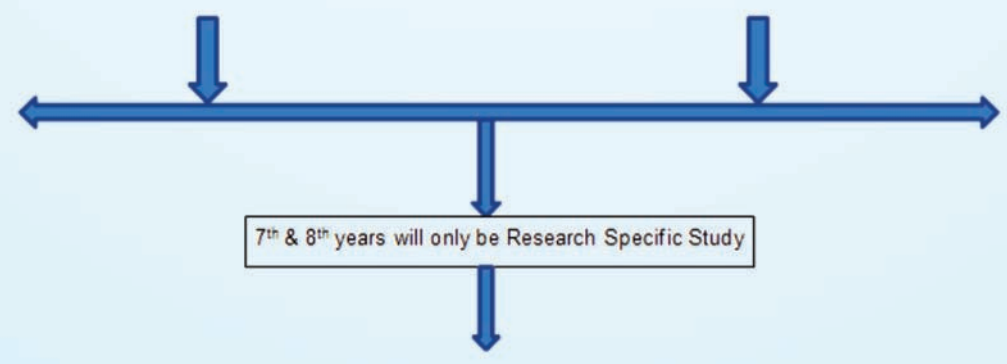
Total Credits: 225 + 2RC

Semester 11			Total Credit: 18	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1	As decided by the Faculty Supervisor		12	2-2-8
2	Research Methodology	Core	3	2-1-0
3	Non-Technical Subject from the Baskets*	Core	2	1-1-0
4	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 12			**Total Credit: 15**	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1	Thesis	Core	12	0–0–12
2	Non-Technical Subject from the Baskets*	Core	2	1-1-0
3	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

2RC can be earned by conferences/journals publication patent/copyright filing/earning, Academia/Consultancy externally/sel f-funded Project, etc., during the academic year.

At the end of 6th year, students will have the following skill set:

1. Research problem formulation skills in the chosen narrower specialized field
2. Relevant software/hardware tools used in the research
3. Research projects writing



Total Credit: 250 + 5RC

7th Year				**Total Credit: 25**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Research Progress Colloquium -I	Core	5	0-0-5
2	Research Problem Specific Course (NPTEL, MOOC, etc.)	Core	12	4-2-6
3	Teaching cum Research Assistantship	Core	8	0-0-8
Total 5RC (3RC during this academic year+ 2RC of 6th year) can be earned by conferences/journals publication patent/copyright filing/earning, Academia/Consultancy externally/self-funded Project, etc.				

At the end of 7th year, students will have the following skill set:

1. Critical Research
2. Reviewing the peer's research works
3. Sharpened experimental and Analytical skills in the chosen field of research

Total Credit: 260 + 12RC

8th Year				**Total Credit: 10**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1	Research Progress Colloquium -II	Core	4	0-0-4
2	PhD Thesis Open Seminar	Core	6	0-0-6
Total 12RC (7RC during this academic year+ 5RC of 6th and 7th years) can be earned by conferences/journals publication patent/copyright filing/earning, Academia/Consultancy externally/selffunded Project, etc.				

At the end of 8th year, students will have the following skill set:

1. Reputed Journal Paper Publications
2. Patent Filing
3. Thesis Writing
4. Consultancy projects

Total Credit: 40

Semester 1				**Total Credit: 20**
S. No.	**Course Name**	**Co re/Elective**	**Credit**	**L-T-P**
1.	Discrete Structures and Linear Algebra	Core	3	2-1-0
2.	Computer Programming	Core	4	2-1-1
3.	IT Workshop in Computer Basics	Core	3	2-0-1
4.	Basic Electronics and Digital Design	Core	4	2-1-1
5.	Non-Technical Subject* (e.g., Essential English / Foundations in Human Values and Ethics / Energy and Environment)	Core	2	1-1-0
6.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
7.	Principles of Management	Core	3	2-0-1
Semester 2				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1.	Probability and Statistics	Core	3	2-1-0
2.	Data Structures	Core	4	2-1-1
3.	Computer Organization and Architecture	Core	4	2-1-1
4.	IT Workshop in Networking and Maintenance	Core	3	2-0-1
5.	Non-Technical Subject*	Core	2	1-1-0
6.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
7.	IT Workshop on Sensors, Actuators and Controllers	Core	3	2-0-1

*Non-technical subject should be chosen from the different baskets
#Community Services through a FAP recognized organization

At the end of 1st year, students will have the following skill set:

1. Knowledge in Computer Basics including unix commands, softwares and hardwares,
2. Students will have the basic programming skills,
3. Students will be able to realize the networking aspects of computers and can manage the IT infrastructure of any organization.
4. Students will be able to develop small-scale innovative IT-Enabled electronic products, IoTs and small-embedded products.
5. Students will have good communication skills.

Total Credit: 80

Semester 3				**Total Credit: 20**
S. No.	**C ourse Name**	**Core/Elective**	**Credit**	**L-T-P**
1.	Univariate and Multivariate Calculus	Core	3	2-1-0
2.	Object Oriented Methodologies	Core	4	2-1-1
3.	Design and Analysis of Algorithms	Core	4	2-1-1
4.	Database Management System	Core	4	2-1-1
5.	IT Workshop in Front-End Development	Core	2	1-0-1
6.	Non-Technical Subject*	Core	2	1-1-0
7.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 4				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1.	Theory of Computation	Core	3	2-1-0
2.	Computer and Communication Networks	Core	4	2-1-1
3.	Operating System	Core	4	2-1-1
4.	IT Workshop in Backend Development	Core	4	2-1-1
5.	Non-Technic al Subject*	Core	2	1-1-0
6.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
7.	Digital Marketing and Search Engine Optimization	Core	2	1-1-0

At the end of 2nd year, students will have the following skill set:

1. Students will have strong foundations in Information Technology in terms of object oriented programming, complexity analysis, operating system, computer and communication networks.
2. Students will be able to manage the databases for the organizations.
3. Students will be able to develop the front-end and back-end solutions by integrating with databases.
4. Students will also have good finance and marketing related understanding of IT solutions.
5. Students will be able to start any digital marketing industry.

Total Credit: 120

Semester 5				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1.	Computer Graphics	Core	3	2-0-1
2.	Artificial Intelligence	Core	3	2-0-1
3.	Machine Learning	Core	3	2-0-1
4.	Image and Video Processing	Core	4	2-1-1
5.	IT Workshop in Webservices and Full Stack Development	Core	4	2-1-1
6.	Non-Technical Subject*	Core	2	1-1-0
7.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 6				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
	Any one specialized module (with 3 subjects + 1 project/ Independent Study / Industrial Project, etc.) may be chosen in the fields of	Core	16	8-4-4
1.	Module-1: Security			
2.	Module-2: Data Science			
3.	Module-3: Robotics			
4.	Module-4: Network and System			
5.	Any other as may be floated by PI			
6.	Non-Technical Subject*	Core	3	2-1-0
7.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

At the end of 3rd year, students will have the following skill set:

1. Students will have good hands-on experience with full stack development and will be able to develop the full fledged projects of webservices.
2. Students will be able to develop the solutions for real-world problems using AI and ML tools for different data, including Images.
3. Based on the elective courses in a theme, the certification can also include that basics in that theme.

Total Credit: 160

Semester 7				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
	Any one specialized module (with 3 subjects + 1 project/ Independent Study / Industrial Project, etc.) may be chosen in the fields of	Core	16	8-4-4
1.	Module-1: Visual Analytics			
2.	Module-2: Cyber Physical Systems			
3.	Module-3: Cognitive Computation			
4.	Module-4: Human Computer Interface			
5.	Any other as may be floated by PI			
6.	Non-Technical Subject*	Core	3	2-1-0
7.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
Semester 8				**Total Credit: 20**
S. No.	**Course Name**	**Core/Elective**	**Credit**	**L-T-P**
1.	Technical Writing (Report, Manual, Proposal, Research Articles, Patents and others)	Core	3	2-1-0
2.	Non-Technical Subject from the Baskets*	Core	3	2-1-0
3.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1
4.	Major Project (Thesis)	Core	2	2-1-0

At the end of 4th year, students will have the following skill set:

1. Students will be able to develop efficient IT solutions for real-world applications.
2. The certification course in 4th year can be in a specialization such as (AI&ML, Cybersecurity, Data Science, etc.) based on the elective courses that specialization.

If the students do not select any specialized domain, then students will be admitted in the regular MTech program

Total Credit: 196

Semester 9			Total Credit: 20	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	Advanced Data Structures and Algorithms	Core	4	2-1-1
2.	Programming Practices	Core	4	2-1-1
3.	Mathematics for IT	Core	4	3-1-0
4.	Research Methodology	Core	3	2-1-0
5.	IT Advances Workshop	Core	2	2-0-0
6.	Non-Technical Subject from the Basket*	Core	2	1-1-0
7.	Sports/Arts/Languages/ Community Services#	Core	1	0-0-1

Semester 10			Total Credit: 16	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	Elective 1	Elective	3	2-1-0
2.	Elective 2	Elective	3	2-1-0
3.	Elective 3	Elective	3	2-1-0
4.	Non-Technical Subject from the Basket* AND Sports/Arts/Languages/ Community Services#	Core	3	2-1-0
5.	MTech Project Part 1	Core	4	0-0-4

If the students choose any specialized domain, then the students will be admitted in the MTech by Research program with chosen specialization

Total Credit: 196

Semester 9			Total Credit: 20	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	Advanced Data Structures and Algorithms	Core	4	2-1-1
2.	Programming Practices	Core	4	2-1-1
3.	Mathematics for IT	Core	4	3-1-0
4.	Research Methodology	Core	3	2-1-0
5.	Overview of IT Advances	Core	2	2-0-0
6.	Non-Technical Subject from the Basket*	Core	2	1-1-0
7.	Sports/Arts/Languages /Community Services#	Core	1	0-0-1

Semester 10			Total Credit: 16	
S. No.	**Cours e Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	As decided by the Faculty Supervisor according to the specialized domain		8	6-2-0
2.	Non-Technical Subject from the Basket* OR Sports/Arts/Languages /Community Services#	Core	2	1-1-0
3.	MTech Thesis Part 1	Core	6	0-0-6

Total Credits: 226 + 2 Research Credits (RC)

Semester 11			Total Credit: 16	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	Elective 5	Elective	3	2-1-0
2.	Elective 6	Elective	3	2-1-0
3.	Elective 7	Elective	3	2-1-0
4.	MTech Project Part 2	Core	4	0-0-4
5.	Non-Technical Subject from the Basket*	Core	2	1-1-0
6.	Spo rts/Arts/Languages/Community Services#	Core	1	0-0-1

Semester 12			Total Credit: 14	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	MTech Thesis	Core	12	0-0-12
2.	Non-Technical Subject from the Basket*	Core	1	1-0-0
3.	Sports/Arts/Languages/Community Services#	C ore	1	0-0-1

Total Credits: 226 + 2RC

Semester 11			Total Credit: 16	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	As decided by the Faculty Supervisor according to the specialized domain		8	6-2-0
2.	MTech Thesis Part 2	Core	6	0-0-6
3.	Non-Technical Subject from the Basket*	Core	1	1-0-0
4.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

Semester 12			Total Credit: 14	
S. No.	**Course Name**	**Core/ Elective**	**Credit**	**L-T-P**
1.	MTech Thesis	Core	12	0-0-12
2.	Non-Technical Subject from the Basket*	Core	1	1-0-0
3.	Sports/Arts/Languages/Community Services#	Core	1	0-0-1

7th and 8th years will only be research specific study

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प्रोफेसर, आई.आई.आई.टी. प्रयागराज

fap@iiita.ac.in; | np@iiita.ac.in;

9451852922; 6387412030

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