GOVERNMENT COLLEGE OF ENGINEERING AND CERAMIC TECHNOLOGY

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Curriculum Design and Development

Additional Information

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			Linkage with Government of India's Initiatives	Justification in brief
Ceramic Technology, B. TECH				
1	Process Calculations	PE(CT) 401 A	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to industrial process optimization.
2	Introduction to Industrial Ceramics	PE(CT) 401 **B**	Production Linked Incentive (PLI) Sche	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to industry that are based on ceramic material like cement, glass etc.
3	Bio Ceramics	PE(CT) 502A	e-Hospital@NIC	Studying a range of topics of immediate relevance to industry makes a student suitable for working in health industries and research. It has several applications in fiel of medical industry as ceramic material is more safe in human body as it reduces health hazard when use as implant.
4	nano Ceramics	PE(CT) 502B	Science, Technology, and Innovation Policy (STIP)	Studying a range of topics of immediate relevance to industry/reseaech makes a student suitable for working in this emerging area. Nano material is next future topic after VLSI design saturates in terms of smaller dimension. It plays imprtant role in paint industry and casting.
5	DBMS	OE(CT) 501A	AGRIMARKET, e-Hospital@NIC	E-governance: To provide efficient and transparent public services to citizens and businesses across different states and districts. E-commerce: To enable online transactions, payments, delivery, and customer service across different markets and regions. E-health: To facilitate health care delivery, diagnosis, treatment, and research across different hospitals
6	OOPS	OE(CT) 501B	Digital India	Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. This course focus on object oriented languages like JAVA used as core of Android and many other applications.
7	Operation Reserach	OE(CT) 501C	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India
8	DBMS LAB	OEL(CT)502A	AGRIMARKET, e-Hospital@NIC	Database application in commecial and government organization
9	OOPS lab	OEL(CT)502B	Digital India	This course is aim to focus on the application and implementation of OOP course as mentioned earlier
10	Operation Reserach lab	OEL(CT)502C	National Supercomputing Mission (NSM)	This course is aim to focus on the application and implementation of optimization of the process in lab.
11	Refractories for Ferrous Industries	PE(CT) 603 A	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to refractoties industry that are based Ferrous materia like steel.
12	Refractories for non Ferrous Industries and other industries	PE(CT) 603B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to refractoties industry that are based non-Ferrous materia like aluminium

13	Total quality Management	OE(CT) 603	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the quality managent of ceramic industry.
14	Environment Engg. & Management	OE(CT) 603B	Production Linked Incentive (PLI) Schemes	Environment is a geat concern nowadays specially for heavy industry. thia paper is focussed on the reduction of pollutant in industry.
15	Non-oxide Ceramics	PE(CT) 704A	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to non oxide ceramic industry.
16	Composites	PE(CT) 704B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the basic concepts related to composites of ceramic industry.
17	AI & Robotics	OE(CT) 704A	National Strategy for Artificial IntelligenceNITI Aayog	National Program on AI: Set up by NITI Aayog The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more.
18	IOT	OE(CT) 704 **B**	Draft Policy on Internet of Things - MeitY Policy/Smart Cities Mission	IoT has become all pervasive. The communication of the processed information is equally important. Different buses and protocols have been designed to support communication in IoT applications. This special course helps the students to get a strong base in IoT applications
19	Machine learning	OE(CT) 704C	National Strategy for Artificial IntelligenceNITI Aayog	Machine learning is a subdomain of artificial intelligence (AI). The goal of machine learning generally is to understand the structure of data and fit that data into models that can be understood and utilized by people. NITI Aayog has partnership with several leading AI technology players to implement AI projects in critical areas such as agriculture and health. Learnings from these projects, under various stages of implementation, experts can give enhanced perspective to the task of crafting the national strategy for AI
20	Ceramic plant & Equipment Design	PEL(CT) 805A	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on theplant and equipments required for ceramic indistry.
21	Furnace & Kilns Design	PEL(CT) 805B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. For production industry, furnace has great importance and the course is desin to maintaining and improve the quality.
Information Technology, B.TECH				

1	Information Theory and Coding	PEC(IT)501A	Digital India	Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. To implement the same in reality, transfer of information is to be done seamlessly. The course focus on the basic concepts related to quantify information content & techniques to impose different error control codings on data stream to identify the presence of error, if possible correct it
2	Computer Graphics	PEC(IT)501B	E-EntryPass, Skill India	This course is to make programming in graphics by using graphical tools. It was setup as a one of its kind, Public Private Partnership Company with the primary mandate of catalysing the skills landscape in India. EEntrypass is a web-based computerized solution for issuance of photo entry passes to visitors to Punjab Civil Secretariat for various reasons. This include Capturing of Visitor's Details along with photograph and also giving provision for entry of multiple visitors.
3	Advanced Computer Architecture	PEC(IT)501C	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India
4	Computational Geometry	PEC(IT)501D	National Strategy for Artificial IntelligenceNITI Aayog	National Program on AI: Set up by NITI Aayog The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more. This paper focusses on computational aspects of Robotics in an intelligent systems.
5	Software Engineering	PEC(IT)602A	Start up India	To promote awareness and adoption of IPRs by Startups and facilitate them in protecting and commercializing the IPRs, Startup India provides access to high quality Intellectual Property services and resources,
6	Cryptography and Network Security	PEC(IT)602B	1. Govt. of India Security Policy of DoT licensees, 2. Crime and criminal tracking network & systems (CCTNS), 3. EOffice Digital Signing Tool (PDF files)	This is a field of study to secure various digital networks and the process of data transfer over those networks. Security system typically relies on different layers of protection and consists of various software and hardware components.
7	Multimedia Systems	PEC(IT)602C	E-EntryPass, Skill India	This course is to make different application through multiple media like text, video and image. Public Private Partnership Company with the primary mandate of catalysing the skills landscape in India. EEntrypass is a web-based computerized solution for issuance of photo entry passes to visitors to Punjab Civil Secretariat for various reasons. This include Capturing of Visitor's Details along with photograph and also giving provision for entry of multiple visitors
8	Wireless Communication	PEC(IT)602D	Telecom Infrastructure Development Policy	Mobile communication has improved by leaps and bounds in the last 40 years . This exponential rate of improvement has resulted in the global communication. The countries, the companies all have gained from this development.They can share the data to generate knowledge/information. The Pandemic has not been able to cripple the civilization only because there was communication. It is improving further through 5G technology. The students acquire knowledge in this domain through this course
9	Optimization Techniques	OEC(IT/CS)601A	Make in India, Micro small medium enterprises	Understand the necessary and sufficient conditions for finding the numerical solutions of the problems in classical optimization

10	Digital Communication	OEC(IT/CS)601B	Telecom Infrastructure Development Policy	"Telecommunications is no longer limited to voice. The evolution from analog to digital technology has facilitated the conversion of voice, data and video to the digital form.This policy is, "to provide secure, reliable, affordable and high quality converged telecommunication services anytime, anywhere for an accelerated inclusive socio-economic development". Knowledge in Digital Communication course content helps to understand the present telecommunication services."
11	Cyber Law and Security Policy	OEC(IT/CS)601C	1. Govt. of India Security Policy of DoT licensees, 2. Crime and criminal tracking network & systems (CCTNS), 3. EOffice Digital Signing Tool (PDF files)	This is a field of study to secure various digital networks and the process of data transfer over those networks. Cyber Physical Security system typically relies on different layers of security protocols.
12	Control System	OEC(IT/CS)601D	Make in India	Control systems ensures that there is a strategic method to improving productivity and enhancing the best practices of any company. A control system should be evaluated frequently to ensure that the processes are where they need to be and functioning efficiently and effectively. This way,one can adhere to industry standards while providing the best service to the customers. With the help of the current paper the students will be able to develop mathematical model of physical systems, investigate the time response of systems and calculate performance indices as well as analyze frequency response and stability of linear systems using different stability criteria.
13	Machine Learning	PEC(IT)703A	National Strategy for Artificial IntelligenceNITI Aayog	Machine learning is a field that deploy cutting age computational techniques to predict or forecast from large volume of data without being explicitly programmed to do so. It is a sub-field of artificial Intelligence that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its prediction accuracy which helps significantly in terms of real-time decision making.
14	Distributed Computing	PEC(IT)703B	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India using advanced algorithms
15	Cloud Computing	PEC(IT)703C	Meghraj cloud initiative by Indian Government	This course is on Study on demand services and applications in the remote computing. The focus of Meghraj cloud initiative is to accelerate delivery of e-services in the country while optimizing ICT spending of the Government. This will ensure optimum utilization of the infrastructure and speed up the development and deployment of eGov applications
16	Real Time Operating Sys.	PEC(IT)703D	National Informatics Centre (NIC)	This is a scheme launched by the Ministry of Electronics and Information Technology (MeitY) that provides various e-governance solutions and services to the central and state governments, such as e-office, eprocurement, e-courts, e-hospital, e-way bill, etc. These solutions and services use real time systems to facilitate online delivery of government services to the citizens and businesses. The justification for this scheme is to enhance the efficiency, convenience, and transparency of governance and public service delivery
17	Web Technology	PEC(IT)704A	eProcurement System of NIC (GePNIC), eHospital@NIC, eGranthalaya: A Digital Agenda for Library Automation and Networking	This course covers the framework of the web programming paradigm. The Web interface is gradually becoming significant in terms e-governance and it is serving a lot to the end user for timely procurement.

18	Internetworking	PEC(IT)704B	National Informatics Centre (NIC)	This is a scheme launched by the Ministry of Electronics and Information Technology (MeitY) that provides various e-governance solutions and services to the central and state governments, such as e-office, eprocurement, e-courts, e-hospital, e-way bill, etc. These solutions and services use real time systems to facilitate online delivery of government services to the citizens and businesses
19	Pattern Recognition	PEC(IT)704C	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more
20	Natural Language Processing	PEC(IT)704D	Society for Natural Language Technology Research (SNLTR) : Department of Information Technology & Electronics. Government of West Bengal	The Society for Natural Language Technology Research is an organization that promotes research in corpus linguistics, computational linguistics and Natural Language Processing in Bengali language. Among its primary goals are creation and archiving of a fully Unicode-compatible Bengali literary corpus to be hosted and published online, as well as the creation of fonts that will help people type Bengali text with ease. In NLP course is designed to study the generic ideas and applications regarding the computational framework of natural language.
21	VLSI Design and Algorithm	OEC(IT/CS)702A	Make in India	Today India has become hub of Chip Design using latest nano technology. Most micro-chips which are being designed are digital in nature. Hence understanding Digital VLSI Design has become must do for ECE Students
22	Digital Signal Processing	OEC(IT/CS)702B	Make in India	Recognizing importance of microelectronics and Digital signal Processing as the major economic contributor in the growth of the country, MeitY initiated the Microelectronics Development Programme in 1980s.
23	Management Information Sys.	OEC(IT/CS)702C	Digital India	This course is a step towards in Digtal India to automte the process in software industry.
24	Big Data Analytics	OEC(IT/CS)702D	Office of the Registrar General & Census Commissioner, India; Digital India	In Digital India large scale of data is generated due to digitization. To analyse this large amount of data, we need analytics for proper utilazion of data. This course is also Record, store, and analyze data in remote server. The Office of the Registrar General & Census Commissioner holds the details of entire India's population, geographical, political and governance
25	Web Technology Lab.	PEC(IT)704AL	eProcurement System of NIC (GePNIC), eHospital@NIC, eGranthalaya: A Digital Agenda for Library Automation and Networking	This lab course covers the framework of the web programming paradigm. The Web interface is gradually becoming significant in terms e-governance and it is serving a lot to the end user for timely procurement.
26	Internetworking Lab.	PEC(IT)704BL	National Informatics Centre (NIC)	This is a scheme launched by the Ministry of Electronics and Information Technology (MeitY) that provides various e-governance solutions and services to the central and state governments, such as e-office, eprocurement, e-courts, e-hospital, e-way bill, etc. These solutions and services use real time systems to facilitate online delivery of government services to the citizens and businesses
27	Pattern Recognition Lab.	PEC(IT)704CL	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more

28	Natural Language Processing Lab.	PEC(IT)704DL	Society for Natural Language Technology Research (SNLTR) : Department of Information Technology & Electronics. Government of West Bengal	The Society for Natural Language Technology Research is an organization that promotes research in corpus linguistics, computational linguistics and Natural Language Processing in Bengali language. Among its primary goals are creation and archiving of a fully Unicode-compatible Bengali literary corpus to be hosted and published online, as well as the creation of fonts that will help people type Bengali text with ease. In NLP course is designed to study the generic ideas and applications regarding the computational framework of natural language.
Information Technology, M. TECH				
1	Internet and Web Technology	ITPEC101A	eProcurement System of NIC (GePNIC), eHospital@NIC, eGranthalaya: A Digital Agenda for Library Automation and Networking	This course covers the framework of the web programming paradigm. The Web interface is gradually becoming significant in terms e-governance and it is serving a lot to the end user for timely procurement.
2	Advanced Software Engineering	ITPEC101B	Start up India	To promote awareness and adoption of IPRs by Startups and facilitate them in protecting and commercializing the IPRs, Startup India provides access to high quality Intellectual Property services and resources,
3	Advanced Data Structures	ITPEC101C	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India using advanced algorithms
4	Information Theory and Coding	ITPEC102A	Digital India	Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. To implement the same in reality, transfer of information is to be done seamlessly. The course focus on the basic concepts related to quantify information content & techniques to impose different error control codings on data stream to identify the presence of error, if possible correct it
5	Pattern Recognition	ITPEC102B	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more
6	Digital Signal Processing	ITPEC102C	Make in India	Recognizing importance of microelectronics and Digital signal Processing as the major economic contributor in the growth of the country, MeitY initiated the Microelectronics Development Programme in 1980s.
7	Cloud Computing	ITPEC102D	Meghraj cloud initiative by Indian Government	This course is on Study on demand services and applications in the remote computing. The focus of Meghraj cloud initiative is to accelerate delivery of e-services in the country while optimizing ICT spending of the Government. This will ensure optimum utilization of the infrastructure and speed up the development and deployment of eGov applications
8	Indian Constitution	ITAUD101A	GOVT of India Policies	The Constitution of India is the supreme law of India. The document lays down the framework demarcating fundamental political code, structure, procedures, powers, and duties of government institutions and sets out fundamental rights, directive principles, and the duties of citizens
9	Value Education	ITAUD101B	GOVT of India Policies	Value education plays an important role to the society. Ethics can not build in a day but it is a practice for lifetime
10	Pedagogy Studies	ITAUD101C	GOVT of India Policies	In Post Graduate course there are large number of students who aspire to be a faculty. This course is a pathway for them.

11	Stress Management by Yoga	ITAUD101D	GOVT of India Policies	In modern day life, Stress is inevitable both in professional and personal life. Yoga which is proud ingeritence of our Indian culture is a recognized tool for stress management woorldwide.
12	Advanced Software Engineering Lab	ITPEC101BL	Start up India	To promote awareness and adoption of IPRs by Startups and facilitate them in protecting and commercializing the IPRs, Startup India provides access to high quality Intellectual Property services and resources,
13	Advanced Data Structures Lab	ITPEC101CL	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India using advanced algorithms
14	Image and video Processing	ITPEC203A	IMAGE policy	Digital image processing is the use of a digital computer to process digital images through suitable algorithms. State level administration supporting a variety of economic and industrial activities by initiating specially designed image policies to promote growth
15	Machine Learning	ITPEC203B	National Strategy for Artificial IntelligenceNITI Aayog	Machine learning is a field that deploy cutting age computational techniques to predict or forecast from large volume of data without being explicitly programmed to do so. It is a sub-field of artificial Intelligence that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its prediction accuracy which helps significantly in terms of real-time decision making.
16	Soft Computing	ITPEC203C	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more
17	Mobile Computing	ITPEC204A	Telecom Infrastructure Development Policy	Mobile Computing is an underlying technology that studies the framework of mobile phones, personal communication systems, wireless networking etc. The objective of a national policy on Telecom Infrastructure is to deal with these issues.
18	IoT and Its Application	ITPEC204B	Draft Policy on Internet of Things - MeitY Policy/Smart Cities Mission	IoT has become all pervasive. The communication of the processed information is equally important. Different buses and protocols have been designed to support communication in IoT applications. This special course helps the students to get a strong base in IoT applications
19	Data Mining	ITPEC204C	AGRIMARKET, e-Hospital@NIC	This course focusses in identifying appropriate data mining algorithm to solve practical problems in minimum time. e-Hospital@NIC - Hospital Management System is a workflow based ICT solution for Hospitals. This is specifically meant for the hospitals in Government Sector. This generic software covers major functional areas like patient care, laboratory services, work flow based document/information exchange, human resource and medical records management in a Hospital.
20	Image and video Processing Lab	ITPEC203AL	IMAGE policy	Digital image processing is the use of a digital computer to process digital images through suitable algorithms. State level administration supporting a variety of economic and industrial activities by initiating specially designed image policies to promote growth

21	Machine Learning Lab	ITPEC203BL	National Strategy for Artificial IntelligenceNITI Aayog	Machine learning is a field that deploy cutting age computational techniques to predict or forecast from large volume of data without being explicitly programmed to do so. It is a sub-field of artificial Intelligence that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its prediction accuracy which helps significantly in terms of real-time decision making.
22	Soft Computing Lab	ITPEC203CL	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more
23	Quantum Computing	ITOEC301A	National Mission on Quantum Technologies and Applications	This course focusses with using the ceramic raw material as thin film coating on metal for better properties like corrosion resistance. In advenced research, it has greater applications.
24	Big Data Analytics	ITOEC301B	Office of the Registrar General & Census Commissioner, India; Digital India	In Digital India large scale of data is generated due to digitization. To analyse this large amount of data, we need analytics for proper utilazion of data. This course is also Record, store, and analyze data in remote server. The Office of the Registrar General & Census Commissioner holds the details of entire India's population, geographical, political and governance
25	Software Project Management	ITOEC301C	Start up India	To promote awareness and adoption of IPRs by Startups and facilitate them in protecting and commercializing the IPRs, Startup India provides access to high quality Intellectual Property services and resources, This paper focusses on the optimization of a project in terms of cost and process flow.
26	Information and System Security	ITOEC301D	1. Govt. of India Security Policy of DoT licensees, 2. Crime and criminal tracking network & systems (CCTNS), 3. EOffice Digital Signing Tool (PDF files)	This is a field of study to secure various digital networks and the process of data transfer over those networks. Security system typically relies on different layers of security protocols.
27	Social Network Analysis	ITOEC301E	Smart city mission	This course is focussed on analytics and knoeledge gather from social media. Feedback in social media is useful to generate snart government
Ceramic Technology, M.TECH				
1	Environmental Engineering & Occupational Health and Safety	M(CT) 105A	India government environment policies/ SWATCH BHAARAT	Large scale ceramic industry traditionally suffer with occupational health hazards. Now with new environmental policies it is important to reduce the pollutant and take maximum safety measures.
2	Separation Technology	M(CT) 105B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the seperation between solid-solid, solid-liquid, liquid-gas etc. It has application in pollution control through reuse of pollutants from the waste seperation
3	Statistical Pros. Cont. in Ceramics	M(CT) 105C	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the statistical methodologies related to industrial process optimization.

	4	Bio Ceramics	M(CT) 204A	e-Hospital@NIC/Production Linked Incentive (PLI) Schemes	Studying a range of topics of immediate relevance to industry makes a student suitable for working in health industries and research. It has several applications in fiel of medical industry as ceramic material is more safe in human body as it reduces health hazard when use as implant.
	5	Technical Ceramic	M(CT) 204B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the ceramic material fabrication which is require higher end technology like high temperatute sustainable material(Gas turbine blades) or high frequency, high end insulators etc.
	6	Ceramic Composite	M(CT) 204C	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the composite of metal and ceramic material to acheive the maximum advantageous properties.
	7	Electronic ceramics	M(CT) 205D	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on the fabriacation of ceramic matrial used in electronics industry like capacotor.
	8	Simulation & Optimization	M(CT) 205E	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors. The course focus on simulation of the process and use optimization techniques to acheive best solutions.
	9	Thin Film Ceramics	M(CT) 205F	Science, Technology, and Innovation Policy (STIP)	This course is focussed on fabrication of thin ceramic coatingmaterial on metal for better properties. It is an emerging research area.
Computer Science & Engineering, B. TECH					
	1	Advance Algorithms	PEC(CS)501A	National Supercomputing Mission (NSM) institutions in India using advanced algorithms	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research
	2	Softcomputing	PEC(CS)501B	National Program on AI: Set up by NITI Aayog	The NITI Aayog of Indian government has taken initiative to apply AI in different fields, such as facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more. Soft computing is a part of artificial intelligence. Students can learn how apply this technique in different projects
	3	Embedded Systems	PEC(CS)501C	Embedded System Design	Studying a range of topics of immediate relevance to industry makes a student suitable for working in industries engaged in Embedded System and Electronic Product development

	Course	Code	Scheme	Description
4	Real Time System	PEC(CS)602A	National Informatics Centre (NIC)	This is a scheme launched by the Ministry of Electronics and Information Technology (MeitY) that provides various e-governance solutions and services to the central and state governments, such as e-office, eprocurement, e-courts, e-hospital, e-way bill, etc. These solutions and services use real time systems to facilitate online delivery of government services to the citizens and businesses3. The justification for this scheme is to enhance the efficiency, convenience, and transparency of governance and public service delivery
5	Information & Coding Theory	PEC(CS)602B	Digital India	Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. To implement the same in reality, transfer of information is to be done seamlessly. The course focus on the basic concepts related to quantify information content & techniques to impose different error control codings on data stream to identify the presence of error, if possible correct it
6	Software Engineering	PEC(CS)602C	Start up India	To promote awareness and adoption of IPRs by Startups and facilitate them in protecting and commercializing the IPRs, Startup India provides access to high quality Intellectual Property services and resources,
7	Bioinformatics	PEC(CS)602D	Bioinformatics National Certification (B	This is a scheme launched by the Department of Biotechnology (DBT) that aims to identify and certify bioinformatics professionals to improve their job placement opportunities. The scheme also provides cash awards to the top ten candidates and eligibility for availing JRF/SRF for pursuing Ph.D. in Indian institutions/universities. The justification for this scheme is to promote the quality and standards of bioinformatics education and training in the country and to create a pool of skilled bioinformatics workforce
8	Machine Learning	PEC(CS)603A	National Strategy for Artificial IntelligenceNITI Aayog	Machine learning is a field that deploy cutting age computational techniques to predict or forecast from large volume of data without being explicitly programmed to do so. It is a sub-field of artificial Intelligence that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its prediction accuracy which helps significantly in terms of real-time decision making.
9	Opeeration Research	PEC(CS)603B		
10	Digital Signal processing	PEC(CS)603C	Make in India	Recognizing importance of microelectronics and Digital signal Processing as the major economic contributor in the growth of the country, MeitY initiated the Microelectronics Development Programme in 1980s.
11	Advance Architecture	PEC(CS)603D	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India
12	History of Science & Engineering	OEC(CS/IT)701A	Department of Science and Technology (DST)	Glorious past of Indian science & Technology is focus area of India government

13	Organizational Behavior	OEC(CS/IT)701B	Production Linked Incentive (PLI) Schemes	Production Linked Incentive (PLI) Schemes is to create national manufacturing champions and generate employment opportunities for the country's youth in different sectors like auto components, automobile, aviation, chemicals, electronic systems, food processing, medical devices, metals and mining, pharmacheuticals, renewable energy, telecom, textiles and apperal and white goods. Manufacturing of these require knowledge of control techniques of process variables. Studying this subject students can acquire knowledge to become part of this scheme.
14	Economic Policies in India	OEC(CS/IT)702A	Production Linked Incentive (PLI) Schemes	This course is intended to discuss basic paradigms of economictools in Technology perspectiv
15	Soft Skills and Interpersonal Communication	OEC(CS/IT)702B	Start Up India/Skill India	The course is intended to improve communication and interaction skill
16	Programming and Application of Advanced Microprocessors	OEC(CS/IT)703A	Embedded System Design	Studying a range of topics of immediate relevance to industry makes a student suitable for working in industries engaged in Microcontroller,Embedded System and Electronic Product development.
17	Control System	OEC(CS/IT)703B	Embedded System Design	Control systems ensures that there is a strategic method to improving productivity and enhancing the best practices of any company. A control system should be evaluated frequently to ensure that the processes are where they need to be and functioning efficiently and effectively. This way,one can adhere to industry standards while providing the best service to the customers. With the help of the current paper the students will be able to develop mathematical model of physical systems, investigate the time response of systems and calculate performance indices as well as analyze frequency response and stability of linear systems using different stability criteria
18	Mobile Computing	OEC(CS/IT)703C	Telecom Infrastructure Development Policy	Mobile Computing is an underlying technology that studies the framework of mobile phones, personal communication systems, wireless networking etc. The objective of a national policy on Telecom Infrastructure is to deal with these issues.
19	Web & Internet	PEC(CS)704A	eProcurement System of NIC (GePNIC), eHospital@NIC, eGranthalaya: A Digital Agenda for Library Automation and Networking	This course covers the framework of the web programming paradigm. The Web interface is gradually becoming significant in terms e-governance and it is serving a lot to the end user for timely procurement.
20	Artificial Intelligence	PEC(CS)704B	National Strategy for Artificial Intelligence NITI Aayoog	This course focusses into the practical implementation related aspects of Artificial Intelligence. NITI Aayog has partnership with several leading AI technology players to implement AI projects in critical areas such as agriculture and health. Learnings from these projects, under various stages of implementation, experts can give enhanced perspective to the task of crafting the national strategy for AI
21	Introduction to Deep Learning	PEC(CS)704C	National Strategy for Artificial Intelligence NITI Aayoog	This course focusses into the practical implementation related aspects of machine learning. NITI Aayog has partnership with several leading AI technology players to implement AI projects in critical areas such as agriculture and health. Learnings from these projects, under various stages of implementation, experts can give enhanced perspective to the task of crafting the national strategy for AI
22	Digital Image processing	PEC(CS)704D	IMAGE policy	Digital image processing is the use of a digital computer to process digital images through suitable algorithms. State level administration supporting a variety of economic and industrial activities by initiating specially designed image policies to promote growth

23	Big Data Analytics	PEC(CS)704E	Office of the Registrar General & Census Commissioner, India; Digital India	In Digital India large scale of data is generated due to digitization. To analyse this large amount of data, we need analytics for proper utilazion of data. This course is also Record, store, and analyze data in remote server. The Office of the Registrar General & Census Commissioner holds the details of entire India's population, geographical, political and governance
24	Internet of Things	PEC(CS)705A	Draft Policy on Internet of Things - MeitY Policy/Smart Cities Mission	IoT has become all pervasive. The communication of the processed information is equally important. Different buses and protocols have been designed to support communication in IoT applications. This special course helps the students to get a strong base in IoT applications
25	Distributed Database	PEC(CS)705B	National Supercomputing Mission (NSM)	This is a scheme launched by the Ministry of Science and Technology (MST) and MeitY that aims to create a network of supercomputers across various academic and research institutions in India using advanced algorithms
26	Computer Graphics	PEC(CS)705C	E-EntryPass, Skill India	This course is to make programming in graphics by using graphical tools. It was setup as a one of its kind, Public Private Partnership Company with the primary mandate of catalysing the skills landscape in India. EEntrypass is a web-based computerized solution for issuance of photo entry passes to visitors to Punjab Civil Secretariat for various reasons. This include Capturing of Visitor's Details along with photograph and also giving provision for entry of multiple visitors.
27	Introduction to Quantum Computing	PEC(CS)705D	National Mission on Quantum Technologies and Applications	The Government in its 2020 budget allocated INR 8000 Crore towards this mission to spur developments in quantum computing, cryptography, communications, and material science
28	Data Mining	PEC(CS)705E	AGRIMARKET, e-Hospital@NIC	This course focusses in identifying appropriate data mining algorithm to solve practical problems in minimum time. e-Hospital@NIC - Hospital Management System is a workflow based ICT solution for Hospitals. This is specifically meant for the hospitals in Government Sector. This generic software covers major functional areas like patient care, laboratory services, work flow based document/information exchange, human resource and medical records management in a Hospital.