

BTECH MATHEMATICS & COMPUTING COURSE STRUCTURE

EFFECTIVE: 2026-27 ADMISSION BATCH

B.TECH. MATHEMATICS & COMPUTING

PROGRAM OBJECTIVES

Program Educational Outcomes (PEOs): Upon completion of the *B.Tech. degree in Mathematics and Computing*, the expected accomplishments of the program's graduates in their professional and personal lives are outlined in the following.

PEO No.	Description
PEO-1	Graduates will develop a strong foundational knowledge in mathematics and computing, enabling them to apply mathematical reasoning, computational techniques, and algorithmic processes to design and solve problems across a broad range of applications.
PEO-2	Graduates will demonstrate the ability to think critically and creatively to innovate and solve complex problems in mathematics and computing, including the capability to conduct research and integrate emerging technologies into their solutions.
PEO-3	Graduates will become effective professionals with a commitment to ethical practices, societal contributions, and lifelong learning. They will possess the skills necessary to lead projects and teams in multidisciplinary environments, both domestically and internationally.
PEO-4	Graduates will maintain an understanding of evolving technologies, adapting their skills accordingly to remain effective and relevant in the rapidly changing fields of mathematics and computing.
PEO-5	Graduates will excel in communicating complex mathematical and technical content clearly and effectively to a variety of audiences. They will also demonstrate the ability to work collaboratively in diverse teams, contributing effectively to the achievement of common goals.

Program Specific Outcomes (PSOs): The program specifies the following outcomes that define the core competencies students will develop during their studies, preparing them for successful careers and meaningful contributions in their respective fields.

PSO No.	Description
PSO-1	Graduates will be able to apply advanced mathematical techniques and tools, including statistical and numerical methods, to model and solve complex real-world problems across various domains such as finance, technology, and engineering.
PSO-2	Graduates will possess strong programming skills and the ability to develop, test, and maintain software applications that utilize mathematical models and algorithms to address industry needs.
PSO-3	Graduates will be proficient in employing modern data analytics tools and machine learning algorithms to interpret and extract meaningful information from large datasets, enabling them to make data-driven decisions.

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PSO-4	Graduates will demonstrate the ability to work effectively in interdisciplinary teams, integrating their mathematical and computing expertise to contribute to innovative solutions in scientific research and industry projects.
PSO-5	Graduates will continuously adapt to emerging technologies and methodologies in mathematics, computing, and their intersections, maintaining relevancy and proficiency in their professional practice.

Program Objectives (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.
(WK8)

B. Tech. [Mathematics & Computing] - Curriculum 2025-2026 Batch								
B.Tech. (Maths & Computing) I SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	BSC	25B11MA113	MATHEMATICS-I	3	1	0	4	4
2	BSC	25B11PH111	PHYSICS-I	3	1	0	4	4
3	BSCL	25B17PH171	PHYSICS LAB-I	0	0	2	1	2
4	ESC	25B11CI112	SOFTWARE DEVELOPMENT FUNDAMENTALS-I	3	1	0	4	4
5	ESCL	25B17CI172	SOFTWARE DEVELOPMENT FUNDAMENTALS LAB-I	0	0	2	1	2
6	ESC	25B11EC111	BASIC ELECTRONICS	3	1	0	4	4
7	ESCL	25B17EC171	BASIC ELECTRONICS LAB	0	0	2	1	2
8	HSMC	25B11HS111	ENGLISH	1	0	2	2	3
9	ESCL	25B17GE171	WORKSHOP	0	0	3	1.5	3
				Total			22.5	28
B.Tech. (Maths & Computing) II SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	BSC	25B11MA211	MATHEMATICS-II	3	1	0	4	4
2	BSC	25B11PH211	PHYSICS-II	3	1	0	4	4
3	BSCL	25B17PH271	PHYSICS LAB-II	0	0	2	1	2
4	ESC	25B11CI211	SOFTWARE DEVELOPMENT FUNDAMENTALS-II	3	1	0	4	4
5	ESCL	25B17CI271	SOFTWARE DEVELOPMENT FUNDAMENTALS LAB-II	0	0	2	1	2
6	HSMCL	25B17HS271	LIFE SKILLS & PROFESSIONAL COMMUNICATION LAB	0	0	2	Audit	2
7	ESCL	25B17GE172	ENGINEERING DRAWING & DESIGN	0	0	3	1.5	3
8	HSMC	25B11HS211	UNIVERSAL HUMAN VALUES (UHV)	2	1	0	3	3
				Total			18.5	24
SUMMER TRAINING - I (4 Weeks)								
B.Tech. (Maths & Computing) III SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	BSC	25B11MA311	PROBABILITY AND RANDOM PROCESSES	3	1	0	4	4
2	PCC	25B11CIXXX	THEORY OF COMPUTATION	3	0	0	3	3
3	PCC	25B11CIXXX	DATA STRUCTURES	3	1	0	4	4
4	PCCL	25B11CIXXX	DATA STRUCTURES LAB	0	0	2	1	2
5	PCC	25B11CI313	DATABASE MANAGEMENT SYSTEMS	3	0	0	3	3
6	PCCL	25B17CI373	DATABASE MANAGEMENT SYSTEMS LAB	0	0	2	1	2
7	PCC	25B11CIXXX	OBJECT ORIENTED PROGRAMMING USING JAVA	0	0	2	1	2
8	SEC	XXXCIXXXX	COMPETITIVE PROGRAMMING - I	0	0	2	1	2
9	HSMC	25B11HS311	ECONOMICS	2	1	0	3	3
10	MNC	25B11GE311	ENVIRONMENTAL STUDIES	3	0	0	Audit	3
11	PRC	25B19MA391	SUMMER TRAINING-I (4 WEEKS)*	4 Weeks			2	0
				Total			23	28

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B.Tech. (Maths & Computing) IV SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	PCC	25BS1MA411	NUMERICAL ANALYSIS FOR MATHEMATICAL COMPUTING	3	0	0	3	3
2	PCCL	25BS7MA471	NUMERICAL ANALYSIS FOR MATHEMATICAL COMPUTING LAB	0	0	2	1	2
3	PCC	25B11MA213	DISCRETE COMPUTATIONAL MATHEMATICS	3	1	0	4	4
4	PCC	25B11CI412	DESIGN AND ANALYSIS OF ALGORITHMS	3	1	0	4	4
5	PCCL	25B17CI472	DESIGN AND ANALYSIS OF ALGORITHMS LAB	0	0	2	1	2
6	PCC	25B11CI413	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	3	0	0	3	3
7	PCCL	25B17CI473	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB	0	0	2	1	2
8	PCCL	25B17MA471	R - SOFTWARE LAB	0	0	2	1	2
9	HSMC	XXXHSXXX	HSS ELECTIVE	2	1	0	3	3
10	PEC	25B11CIXXX	DISCIPLINE ELECTIVE – 1	2	0	0	2	2
	PECL	25B11CIXXX	DISCIPLINE ELECTIVE – 1 LAB	0	0	2	1	2
11	SEC	25B17CI476	COMPETITIVE PROGRAMMING – II	0	0	2	1	2
				Total			25	31
SUMMER TRAINING – II (6 Weeks)								
B.Tech. (Maths & Computing) V SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	PCC	XXXMAXXX	REAL ANALYSIS AND DIFFERENTIAL EQUATIONS	3	1	0	4	4
2	PCC	XXXMAXXX	THEORY & APPLICATIONS OF LINEAR ALGEBRA	3	0	0	3	3
3	PCC	XXXCIXXXX	OPERATING SYSTEMS	3	0	0	3	3
4	PCCL	XXXCIXXXX	OPERATING SYSTEMS LAB	0	0	2	1	2
5	PCCL	XXXCIXXXX	FULL STACK DEVELOPMENT LAB	0	0	2	1	2
6	BSC	XXXXXXX	SCIENCE ELECTIVE	3	0	0	3	3
7	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 2	2	0	0	2	2
8	PECL	XXXXXXX	DISCIPLINE ELECTIVE – 2 LAB	0	0	2	1	2
9	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 3	3/2	0	0/2	3	3/4
11	HSC	XXXHSXXX	LOGICAL AND QUANTITATIVE TECHNIQUES-I	2	0	0	2	2
12	OMC	XXXHSXXX	INDIAN CONSTITUTION & TRADITIONAL KNOWLEDGE	2	0	0	Audit	2
13	SEC	XXXCIXXXX	COMPETITIVE PROGRAMMING – III	0	0	2	1	2
114	PR	25B19MA591	SUMMER TRAINING-II	6 Weeks			2	0
				Total			26	30/31

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B.Tech. (Maths & Computing) VI SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	PCC	XXXECXXXX	COMPUTER NETWORKS& IoT	3	0	0	3	3
2	PCC	XXXECXXXX	COMPUTER NETWORKS&IoT LAB	0	0	2	1	2
3	PCC	XXXMAXXXX	STATISTICAL METHODS AND APPLICATIONS	3	0	0	3	3
4	PCC	XXXMAXXXX	STATISTICAL METHODS AND APPLICATIONS LAB	0	0	2	1	2
5	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 4	3	0	0	3	3
6	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 5	3	0	0	3	3
7	OEC	XXXXXXX	OPEN ELECTIVE –1	3	0	0	3	3
8	HSC	XXXHSXXX	LOGICAL AND QUANTITATIVE TECHNIQUES-II	2	0	0	2	2
9	VAC	XXXCIXXXX	SELECTED VALUE-ADDED COURSE	2	0	0	Audit	2
10	HSC	XXXHSXXX	SOFT SKILLS FOR EMPLOYABILITY	0	0	2	1	2
11	PR	25B19MAXXX	MINOR PROJECT	0	0	4	2	4
				Total			22	29
SUMMER TRAINING - III (6 Weeks)								
B.Tech. (Maths & Computing) VII SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 6	3	0	0	3	3
2	OEC	XXXXXXX	OPEN ELECTIVE –2	3	0	0	3	3
3	PR	XXXXXXX	SUMMER TRAINING-III	6 Weeks			4	0
4	PR	XXXXXXX	MAJOR PROJECT – I	0	0	8	4	8
				Total			14	14
B.Tech. (Maths & Computing) VIII SEMESTER								
S. No.	Category Code	Subject Code	Name of the Subjects	Course Hours			Credits	Total Hours
				L	T	P		
1	PEC	XXXXXXX	DISCIPLINE ELECTIVE – 7	3	0	0	3	3
2	OEC	XXXXXXX	OPEN ELECTIVE –3	3	0	0	3	3
3	PR	XXXXXXX	MAJOR PROJECT –II	0	0	16	8	16
				Total			14	22

			Total Credits	165
1	Basic Science	BSC		22
2	Basic Science Lab	BSCL		2
3	Engineering Science	ESC		10
4	Engineering Science Lab	ESCL		7
5	Humanities & Social Sciences	HSMC		16
6	Humanities & Social Sciences Lab	HSMCL		1
7	Professional Core	PCC		41
8	Professional Core Lab	PCCL		11
9	Professional Elective	PEC		19
10	Professional Elective Lab	PECL		2
11	Open Elective	OEC		9
12	Mandatory Course	MNC		Audit
13	Project/Seminar	PR		22
14	Skill Enhancement Course	SEC		3
15	Value Added Courses	VAC		Audit

Total 165

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Baskets - B.Tech. (M&C) 2025-2026 Admitted Batch

Department of CSE & Mathematics
Bucket Wise Tentative List of Elective Courses
(2025-2026 Admitted Batch) (To be updated)

HSS ELECTIVE (4th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	25B1WHS431	Introduction to Finance and Accounting	2	1	0	3	3
2	XXXXXXX	India in a Globalized World: Democracy, Development and Contemporary Challenges	2	1	0	3	3
3	XXXXXXX	Career Readiness Blueprint: From Campus to Corporate	2	1	0	3	3
4	XXXXXXX	AI and Society	2	1	0	3	3

Discipline Elective – 1 and Discipline Elective – 1 Lab (offered in 4th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXXX	Data Analytics using R and Python	2	0	0	2	2
2	XXXXXXX	Mobile Application Development	2	0	0	2	2
3	XXXXXXX	Fundamentals of Smart Systems and IoT	2	0	0	2	2
4	XXXXXXX	Introduction to Compiler Design	2	0	0	2	2
5	XXXXXXX	Data Analytics using R and Python Lab	0	0	2	2	1
6	XXXXXXX	Mobile Application Development Lab	0	0	2	2	1
7	XXXXXXX	Fundamentals of Smart Systems and IoT Lab	0	0	2	2	1
8	XXXXXXX	Introduction to Compiler Design Lab	0	0	2	2	1
9	XXXXXXX	Data Engineering	2	0	0	2	2
10	XXXXXXX	Data Engineering Lab	0	0	2	2	1
11	XXXXXXX	Foundation of Data Science and Visualization	2	0	0	2	2
12	XXXXXXX	Foundation of Data Science and Visualization Lab	0	0	2	2	1
13	XXXXXXX	Computational Fundamentals for Optimization	2	0	0	2	2
14	XXXXXXX	Computational Fundamentals for Optimization Lab	0	0	2	2	1
15	XXXXXXX	Artificial and Computational Intelligence	2	0	0	2	2
16	XXXXXXX	Artificial and Computational Intelligence Lab	0	0	2	2	1

Discipline Elective – 2 and Discipline Elective – 2 Lab (offered in 5th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXXX	Fundamentals of Soft Computing	2	0	0	2	2
2	XXXXXXX	Fundamentals of Computer and Cyber Security	2	0	0	2	2
3	XXXXXXX	Data Mining and Data Warehousing	2	0	0	2	2
4	XXXXXXX	Agile Software Development Process	2	0	0	2	2
5	XXXXXXX	IoT Analytics	2	0	0	2	2
6	XXXXXXX	Fundamentals of Soft Computing Lab	0	0	2	2	1
7	XXXXXXX	Fundamentals of Computer and Cyber Security Lab	0	0	2	2	1

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8	XXXXXX	Data Mining and Data Warehousing Lab	0	0	2	2	1
9	XXXXXX	Agile Software Development Process Lab	0	0	2	2	1
10	XXXXXX	IoT Analytics Lab	0	0	2	2	1
11	XXXXXXX	Big Data Analytics	2	0	0	2	2
12	XXXXXXX	Big Data Analytics Lab	0	0	2	2	1
13	XXXXXXX	Search in AI	2	0	0	2	2
14	XXXXXXX	Search in AI Lab	0	0	2	2	1

Discipline Elective – 3 and Discipline Elective – 3 Lab (offered in 5th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Image Processing and Computer Vision	2	0	0	2	2
2	XXXXXX	Introduction to Blockchain Technology	2	0	0	2	2
3	XXXXXX	Computing for Data Science	2	0	0	2	2
4	XXXXXX	Sensor Technology & Android Programming	2	0	0	2	2
5	XXXXXX	Concept of Graph Theory	2	0	0	2	2
6	XXXXXX	Image Processing and Computer Vision Lab	0	0	2	2	1
7	XXXXXX	Introduction to Blockchain Technology Lab	0	0	2	2	1
8	XXXXXX	Computing for Data Science Lab	0	0	2	2	1
9	XXXXXX	Sensor Technology & Android Programming Lab	0	0	2	2	1
10	XXXXXX	Concept of Graph Theory Lab	0	0	2	2	1
11	XXXXXXX	Computational Data Analysis	2	0	0	2	2
12	XXXXXXX	Computational Data Analysis Lab	0	0	2	2	1

Discipline Elective – 4 (offered in 6th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Introduction to Deep Learning	3	0	0	3	3
2	XXXXXX	Cryptocurrency Technologies	3	0	0	3	3
3	XXXXXX	Information Retrieval and Semantic Web	3	0	0	3	3
4	XXXXXX	Cloud Computing Essentials: Azure and AWS	3	0	0	3	3
5	XXXXXX	Operations Research	3	0	0	3	3
6	XXXXXX	Number Theory	3	0	0	3	3
7	XXXXXXX	Reinforcement Learning	3	0	0	3	3
8	XXXXXXX	Responsible AI and AI Ethics	3	0	0	3	3

Discipline Elective – 5 (offered in 6th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Optimization Techniques	3	0	0	3	3
2	XXXXXX	Mathematical Modelling and Simulation	3	0	0	3	3
3	XXXXXXX	Statistical Analysis and Computing	3	0	0	3	3
4	XXXXXXX	Time Series Analysis and Forecasting	3	0	0	3	3
5	XXXX	Soft Computing and Optimization Algorithms	3	0	0	3	3

Discipline Elective – 6 (offered in 7th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXX	Machine Learning and Natural Language Processing	3	0	0	3	3
2	XXXX	Ethical Hacking & Prevention	3	0	0	3	3
3	XXXX	Introduction to Large Scale Database Systems	3	0	0	3	3
4	XXXX	Introduction to DevOps	3	0	0	3	3
5	XXXX	Industrial Automation and IOT	3	0	0	3	3
6	XXXX	Fuzzy Sets, Logic and Applications	3	0	0	3	3
7	XXXXXXXX	Probabilistic Graphical Models	3	0	0	3	3
8	XXXXXXXX	AI for IoT	3	0	0	3	3
9	XXXXXXXX	Explainable AI	3	0	0	3	3
10	XXXXXXXX	Sentiment Analysis and Opinion Mining	3	0	0	3	3

Discipline Elective – 7 (offered in 8th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	AI for Healthcare & Smart Systems	3	0	0	3	3
2	XXXXXX	Digital Forensics and Cyber Laws	3	0	0	3	3
3	XXXXXX	Social Network Analysis	3	0	0	3	3
4	XXXXXX	Software Construction using Kubernetes and Micro-services	3	0	0	3	3
5	XXXXXX	Algebraic Coding and Cryptography	3	0	0	3	3
6	XXXXXX	Linear Algebra for Data Science and Machine Learning	3	0	0	3	3
7	XXXXXXXX	AI for Finance	3	0	0	3	3
8	XXXXXXXX	Agentic AI	3	0	0	3	3

Science Elective (offered in 5th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Physics of Renewable Energy Systems	3	0	0	3	3
2	XXXXXX	Optoelectronic Materials and Devices	3	0	0	3	3
3	XXXXXX	Physics of Functional Materials & Devices	3	0	0	3	3
4	XXXXXX	Physics of Medical Imaging Techniques	3	0	0	3	3
5	XXXXXX	Science and Technology of Materials	3	0	0	3	3
6	XXXXXX	Applied Materials Science	3	0	0	3	3
7			3	0	0	3	3
8			3	0	0	3	3

Open Elective – 1 (offered in 6th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Waste to Energy Conversion	3	0	0	3	3
2	XXXXXX	Solid State Electronic Devices	3	0	0	3	3
3	XXXXXX	Photovoltaic Techniques	3	0	0	3	3
4	XXXXXX	Applied Statistical Mechanics	3	0	0	3	3
5	XXXXXX	Medical and Industrial Applications of Nuclear Radiations	3	0	0	3	3
6	XXXXXX	Cyber Security	3	0	0	3	3
7	XXXXXX	Introduction to Information Theory	3	0	0	3	3
8	XXXXXX	Sociology of Youth	3	0	0	3	3

Open Elective – 2 (offered in 7th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Healthcare Marketplace	3	0	0	3	3
2	XXXXXX	Stress: Biology, Behaviour and Management	3	0	0	3	3
3	XXXXXX	HUMAN RESOURCE ANALYTICS	3	0	0	3	3
4	XXXXXX	Superconducting Materials, Magnets and Devices	3	0	0	3	3
5	XXXXXX	Introduction to Quantum Information Processing	3	0	0	3	3
6	XXXXXX	Nanoscience and Technology	3	0	0	3	3
7	XXXXXX	Algorithm and Analysis and AI	3	0	0	3	3

Open Elective – 3 (offered in 8th Semester)

S. No.	Course Code	Course Title	L	T	P	Total	Credits
1	XXXXXX	Photonics and Applications	3	0	0	3	3
2	XXXXXX	Astrophysics	3	0	0	3	3
3	XXXXXX	Biophysics	3	0	0	3	3
4	XXXXXX	Plasma Physics	3	0	0	3	3