



ECE -2022 SCHEME (III –VIII SEMESTER)

(EFFECTIVE FROM THE ACADEMIC YEAR 2022-23)



GLOBAL ACADEMY OF TECHNOLOGY

(Autonomous institution affiliated to VTU, Belagavi.

Accredited by NAAC with 'A' grade,

NBA Accredited CS, E&C, E&E, MECH, CV and IS branches)

Ideal Homes Township,

Raja Rajeshwari Nagar, Bengaluru-560098


HEAD OF THE DEPARTMENT
Dept. of Electronics & Communication Engg
Global Academy of Technology
Rajarajeshwarinagar, Bangalore - 98.


H.P. Rajashekar Shams
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Rajarajeshwarinagar, Bengaluru-98



Global Academy of Technology, Bengaluru

(An Autonomous Institution, affiliated to VTU, Bellary, recognized by Karnataka and Approved by AICTE, New Delhi.)

B.E. in Electronics and Communication Engineering Scheme of Teaching and Examinations 2022

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(Effective from the academic year 2022-23)



III Semester

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			Credits
					L	T	P	CIE	SEE	Total	
1	22MAT31E	Transforms, Complex Variables and Special Functions	BS	MAT	2	2	0	50	50	100	3
2	22ECE32	Analog Electronic Circuits	IPC		3	0	2	50	50	100	4
3	22ECE33	Design and Analysis of Digital Circuits	PC		3	0	0	50	50	100	3
4	22ECE34	Network Analysis	PC		2	2	0	50	50	100	3
5	22ECE35	Object Oriented Programming using C++	ESC/ETC/PLC	Respective Department	2	0	2	50	50	100	3
6	22ECE36	Sensors and Instrumentation	AEC		3	0	0	50	50	100	3
7	22ECEL37	Digital System Design Laboratory	PCL		0	0	2	50	50	100	1
Total								350	350	700	20

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IV Semester

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			Credits
					L	T	P	CIE	SEE	Total	
1	22MAT41E	Advanced Linear Algebra and Probability	BS	MAT	2	2	0	50	50	100	3
2	22ECE42	Principles of Communication Systems(Integrated)	IPC	Respective Department	3	0	2	50	50	100	4
3	22ECE43	Control Systems	PC		3	0	0	50	50	100	3
4	22ECE44	Signals and Systems	PC		2	2	0	50	50	100	3
5	22ECE45	Data Structures using C++	ESC/ETC/PLC		2	0	2	50	50	100	3
6	22ECE46	Verilog HDL	AEC		2	2	0	50	50	100	3
7	22ECEL47	HDL Laboratory	PCL		0	0	2	50	50	100	1
Total								350	350	700	20

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V SEMESTER:

Sl. No.	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours / Week				Examination			Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks		Total Marks
1	HSMS 22ECE51	Engineering Economics and Management	ECE	3	0	0		03	50	50	100	3
2	IPCC 22ECE52	Digital Communication Systems (Integrated)	ECE	2	2	2		03	50	50	100	4
3	PCC 22ECE53	Digital Signal Processing	ECE	3	2	0		03	50	50	100	4
4	PCCL 22ECEL54	Digital Signal Processing Laboratory	ECE	0	0	2		03	50	50	100	1
5	PEC 22ECE55*	Professional Elective - I	ECE	3	0	0		03	50	50	100	3
6	PROJ 22ECE56	Mini Project	ECE	0	0	4		03	100		100	2
7	AEC 22RMIK57	Research Methodology and IPR	Any Department	2	2	0		03	50	50	100	3
8	MC 22CIVK58	Environmental Studies	TD: CV/Env/Chem PSB: CV	2	0	0		02	50	50	100	2
9	MC 22PEK59	22NSK59	NSS coordinator									
		Physical Education (PE) (Sports and Athletics)	Physical Education Director	0	0	2			100		100	0
		Yoga	Yoga Teacher									
				Total				550	350	900	22	


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Professional Elective Course - I			
22ECE55A	Programming in Java	22ECE55C	Engineering Electromagnetics
22ECE55B	Operating Systems	22ECE55D	Satellite Communication
PCC: Professional Core Course, PCCL: Professional Core Course laboratory, UHV: Universal Human Value Course, MC: Mandatory Course (Non-credit), AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, L: Lecture, T: Tutorial, P: Practical S= SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation. K: The letter in the course code indicates common to all the stream of engineering. PROJ: Project /Mini Project. PEC: Professional Elective Course.			
Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching-Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23			
National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.			
Mini-project work: Mini Project is a laboratory-oriented/hands on course that will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications etc. Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students.			
CIE procedure for Mini-project: (i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two faculty members of the Department, one of them being the Guide. The CIE marks awarded for the Mini-project work shall be based on the evaluation of the project report, project presentation skill, and question and answer session in the ratio of 50:25:25. The marks awarded for the project report shall be the same for all the batches mates. (ii) Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the project. The CIE marks awarded for the Mini-project, shall be based on the evaluation of the project report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates. No SEE component for Mini-Project.			
Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.			

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VI SEMESTER:

Sl. No.	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks		
													L
1	IPCC	22ECE61	Embedded Systems (Integrated)	ECE	2	2	2		03	50	50	100	4
2	PCC	22ECE62	CMOS VLSI Design	ECE	3	2	0		03	50	50	100	4
3	PEC	22ECE63X	Professional Elective - II	ECE	3	0	0		03	50	50	100	3
4	OEC	22ECE64X	Open Elective - I	ECE	3	0	0		03	50	50	100	3
5	PROJ	22ECEP65	Major Project Phase - I	ECE	0	0	4		03	100	-	100	2
6	PCCL	22ECEL66	CMOS VLSI Design Laboratory	ECE	0	0	2		03	50	50	100	1
7	AEC/ SDC	22ECE67X	Ability Enhancement Course/ SkillDevelopment Course - III	ECE	If the course is offered as a Theory				01	50	50	100	1
					1	0	0						
					If course is offered as a practical								
8	MC	22NSK68	National Service Scheme (NSS)	NSS coordinator	0	0	2		100	--	100	0	
		22PEK68	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		22YOK68	Yoga	Yoga Teacher									
9	IKS	22IKSK69	Indian Knowledge System		1	0	0		01	50	50	100	0
10	UHV	22UHV69	Universal Human Values	Any Department	1	0	0		01	50	50	100	0
					Total					600	400	1000	18
Professional Elective Course-II													
22ECE63A	Digital Image Processing			22ECE63C	Information Theory and Coding								
22ECE63B	Machine Learning with Python			22ECE63D	Microwave and Radar								

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Open Elective Course-I			
22ECE64A	Communication Engineering Systems	22ECE64C	Electronic Circuits with Verilog
22ECE64B	Micro Electro Mechanical Systems	22ECE64D	Introduction to Digital Image Processing
Ability Enhancement Course / Skill Enhancement Course - III			
22ECE67A	Communication Simulink Toolbox	22ECE67C	Multimedia Communication
22ECE67B	Digital Image Processing Laboratory	22ECE67D	Internet of Things and Cloud Computing
PCC: Professional Core Course, PCCCL: Professional Core Course laboratory, UHV: Universal Human Value Course, MC: Mandatory Course (Non-credit), AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, L: Lecture, T: Tutorial, P: Practical S= SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation. K: The letter in the course code indicates common to all the stream of engineering. PROJ: Project /Mini Project. PEC: Professional Elective Course. PROJ: Project Phase -I, OEC: Open Elective Course			

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching-Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

Project Phase-I : Students have to discuss with the mentor /guide and with their help he/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.


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Scheme A- VII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits			
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks		Total Marks		
1	IPCC	22ECE71	Computer Communication Networks (Integrated)	ECE	3	0	2		03	50	50	100	4	
2	IPCC	22ECE72	Antenna and Wavepropagation (Integrated)	ECE	3	0	2		03	50	50	100	4	
3	PCC	22ECE73	Cryptography	ECE	3	2	0		03	50	50	100	4	
4	PEC	22ECE74x	Professional Elective-III	ECE	3	0	0		03	50	50	100	3	
5	OEC	22ECE75x	Open Elective- II	ECE	3	0	0		01	50	50	100	3	
6	PROJ	22ECEP76	Major Project Phase-II	ECE	0	0	12		03	100	100	200	6	
Professional Elective Course-III										Total	350	350	700	24
22ECE74A	Advanced VLSI			22ECE74C	Optical Fiber Communication									
22ECE74B	High Performance Computer Networks			22ECE74D	Biomedical Signal Processing									
Open Elective Course-II														
22ECE75A	Wireless and Mobile Networks			22ECE75C	Smart Sensors & Instrumentation									
22ECE75B	Automotive Electronics			22ECE75D	Multimedia Communication									
PCC: Professional Core Course, FCCI: Professional Core Course laboratory, PEC: Professional Elective Course, OEC: Open Elective Course PR: Project Work, L: Lecture, T: Tutorial, P: Practical S= SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation, TD- Teaching Department, PSB: Paper Setting department, OEC: Open Elective Course, PEC: Professional Elective Course. PROJ: Project work														
Note: VII and VIII semesters of IV years of the program														
(1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI semester.														
(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.														

Note: VII and VIII semesters of IV years of the program

- (1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI semester.
(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.

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Professional Elective Courses (PEC):

A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

PROJECT WORK (22ECEP76):

The objective of the Project work is

- (i) To encourage independent learning and the innovative attitude of the students.
- (ii) To develop interactive attitude, communication skills, organization, time management, and presentation skills.
- (iii) To impart flexibility and adaptability.
- (iv) To inspire team working.
- (v) To expand intellectual capacity, credibility, judgment and intuition.
- (vi) To adhere to punctuality, setting and meeting deadlines.
- (vii) To install responsibilities to oneself and others.
- (viii) To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involve in group discussion to present and exchange ideas.

CIE procedure for Project Work:

- [1]. **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work, shall be based on the evaluation of the project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

- [2]. **Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work, shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE procedure for Project Work:

SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25.


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Scheme A- VIII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits			
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks		Total Marks		
1	PEC	22ECE81x	Professional Elective -IV (Online Courses)	ECE	3	0	0		03	50	50	100	3	
2	OEC	22ECE82x	Open Elective - III (Online Courses)	ECE	3	0	0		03	50	50	100	3	
3	INT	22ECEI83	Internship (Industry/Research) (14 - 20 weeks)	ECE	0	0	12		03	100	100	200	10	
Total											200	200	400	16

Professional Elective Course-IV (Online courses)

22ECE81A	BOS Recommended Course	22ECE81C	BOS Recommended Course
22ECE81B	BOS Recommended Course	22ECE81D	BOS Recommended Course
Open Elective Course-III (Online Courses)			
22ECE82A	BOS Recommended Course	22ECE82C	BOS Recommended Course
22ECE82B	BOS Recommended Course	22ECE82D	BOS Recommended Course

L: Lecture, **T:** Tutorial, **P:** Practical **S=SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work, **INT:** Industry Internship / Research Internship / Rural Internship

Note: VII and VIII semesters of IV years of the program Swapping Facility

- Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate research internships/ industry internships/Rural Internship after the VI semester.
- Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.

Elucidation:

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At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester **Research Internship /Industrial Internship / Rural Internship** shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship.

Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation centre, Incubation centre, Start-up, centre of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes.

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavour of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

Rural Internship: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment.

The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship. The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (within or outside the state or abroad), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. **University shall not bear any cost involved in carrying out the internship by students.** However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.



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Scheme B: VII and VIII semesters for the candidates who seek an internship with project work

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours / Week				Examination			Credits		
				Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks		Total Marks	
1	PCC	22ECE71	Computer Communication Networks (Integrated) To be completed in 5th/6th semester	TD: ME PSB: ME	3	0	2		03	50	50	100	4
2	PCC	22ECE72	Antenna and Wavepropagation (Integrated) To be completed in 5th /6th semester	TD: ME PSB: ME	3	0	2		03	50	50	100	4
3	PCC	22ECE73	Cryptography To be completed in the 6 th semester	TD: ME PSB: ME	4	0	0		03	50	50	100	3
4	PEC	22ECE74x	Professional Elective Course (MOOC Courses)	TD: ME PSB: ME	3	0	0		03	50	50	100	3
5	OEC	22ECE75x	Open Elective Courses (MOOC courses)	TD: ME PSB: ME	3	0	0		01	50	50	100	3
1	PEC	22ECE81x	Professional Elective -IV (Online Courses)	TD: ME PSB: ME	3	0	0		03	50	50	100	3
2	OEC	22ECE82x	Open Elective - III (Online Courses)	TD: ME PSB: ME	3	0	0		01	50	50	100	3
3	PROJ	22ECEI83	Project – Outcome of Training	TD: ME PSB: ME	0	0	12		03	100	100	200	9
4	INT	22ECE81x	Internship (Industry/Research) (02 semesters)	TD: ME	0	0	12		03	100	100	200	10
				Total					03	550	550	1100	42

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