

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI



THREE-YEAR UNDERGRADUATE PROGRAMME

Bachelor of Science (B.Sc.)

Subject: ELECTRONICS

FACULTY: SCIENCE AND TECHNOLOGY

(Courses effective from Academic Year 2026-2027 Under Uniform NEP 2020)

Scheme of Teaching-Learning-Evaluation, Credit Distribution, Workload Calculation and Examination

Credit Distribution

Three/Four-year UG Degree Programme (Level 4.5 to 5.5)

Vertical	Vertical Type	I	II		III	IV	V	VI	Total Credits	Grand Total
	(i) Three-year UG Degree Programme (Level 4.5.to 5.5)									
A	Major DSC (60–64) (Minimum 50% of Total Credits)	4	4	Major	6	8	8	8	38	48
				IKS	2				2	
		0	0	Elective	0	0	4	4	8	
B	Minor (from same faculty of DSC) (18–24)	4	4		4	4	4	4	24	24
C	Generic/Open Elective (OE) (Faculty-wise basket other than Major/Minor faculty) (10–12)	4	4		2	2	0	0	12	12
D(i)	Vocational Skill Courses (VSEC) corresponding to Major/Minor (8–10)	0	2		2	2	2	2	10	16
D(ii)	Skill Enhancement Courses (SEC)	2	2		0	0	2	0	6	
E(i)	Ability Enhancement Courses (AEC) (English + Modern Indian Language)	1+1	1+1		1+1	1+1	0	0	8	14
E(ii)	Indian Knowledge System (IKS) 2 Generic	2	0		0	0	0	0	2	
E(iii)	Value Education Courses (VEC) (Understanding India, EVS, Digital & Technological Solution) 4	2	2		0	0	0	0	4	
F(i)	Internship / Apprenticeship corresponding to Major 8 (OJT)	0	0		0	0	0	4	4	18
F(ii)	Field Projects / Community Engagement & Service (CEP) corresponding to Major 4-6	0	0		2	2	2	0	6	
F(iii)	Co-curricular Courses (CC) (health & wellness, yoga education, sports, fitness, cultural activities, NSS/ NCC & Fine/ Applied/ Visual/ Performing Arts 8	2	2		2	2	0	0	8	
	Total Credits per Semester	22	22		22	22	22	22	132	132

(ii) Four-year UG Degree programme (Level 6.0) Honors Degree in Major or Minor				
A. Honors Degree in Major or Minor				
	Vertical Type		Semester VII	Semester VIII
	Major (Offered at Three-year UG Programme)	Mandatory	12-14(2*4+2*2 or 3*4+2)	12-14(2*4+2*2 or 3*4+2)
		Elective	4	4
	Research Methodology (RM)		4	0
	On the Job Training (OJT)		0	4
	Total		22	22
	Cumulative		(132+44) 176	
(ii) Four-year UG Degree Programme (Level 6.0)				
B. Honors with Research Degree in Major or Minor				
	Major (Offered at Three-year UG Programme)		Semester VII	Semester VIII
		Mandatory	8-10 (24+2 or 24)	8-10 (24+2 or 24)
		Elective	4	4
	Research Methodology (RM)		4	0
	Research Project (RP)		4	8
	Total		22	22
	Cumulative		(132+44) 176	

Sant Gadge Baba Amravati University, Amravati

Teaching and Learning Scheme for the Degree of Bachelor of Science

FACULTY: SCIENCE AND TECHNOLOGY

TLE Scheme for FIRST YEAR: SEMESTER – I (Electronics) (Level 4.5)

(As per uniform NEP Scheme)

The Vertical	Type of Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal		Max. Marks	Min. Marks
						Max. Marks	Min. Marks	Max. Marks	Min. Marks		
Major	Theory	113201	Fundamental of Electronics	2	2	30	9	20	6	50	20
	Lab/Practical 1	113202	Practical based on Major Theory 1	2	4	25	10	25	10	50	20
Minor	Theory	113201	Fundamental of Electronics	2	2	30	9	20	6	50	20
	Lab/Practical 1	113202	Practical based on Major Theory 1	2	4	25	10	25	10	50	20
GOEC	Theory 1	113203	CCTV Installation and Maintenance	2	2	30	9	20	6	50	20
GOEC	Theory 2	113204	E-Waste Management	2	2	30	9	20	6	50	20
VSC	-	-	-	-	-	-	-	-	-	-	-
SEC	Lab/Practical 2	113205	Skill Oriented Practical on Major Electronics	2	4	-	-	50	20	50	20
AEC - English	Theory		Refer University basket	1	1						
AEC –MIL	Theory		Refer University basket	1	1						
IKS-Generic	Theory		Refer University basket	2	2						
VEC	Theory		Refer University basket	2	2						
CC	Outdoor		Separate SOP will be released	2	4						
TOTAL				22	30						

TLE Scheme for FIRST YEAR: SEMESTER – II (Level 4.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal			
						Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks
Major	Theory 2	113206	Semiconductor Devices	2	2	30	9	20	6	50	20
	Lab/Practical 3	113207	Practical based on Major Theory 2	2	4	30	9	20	6	50	20
Minor	Theory 2	113206	Semiconductor Devices	2	2	25	10	25	10	50	20
	Lab/Practical 3	113207	Practical based on Major Theory 2	2	4	30	9	20	6	50	20
GOEC	Theory 3	113208	Maintenance & Troubleshooting of Electronic Applications	2	2	25	10	25	10	50	20
GOEC	Theory 4	113209	Computer Hardware & Maintenance	2	2	30	9	20	6	50	20
VSC	Lab/Practical 4	113210	Advanced Practical on Major Theory 2	2	4	-	-	50	20	50	20
SEC	Lab/Practical 5	113211	Skill Oriented Practical on Major Electronics	2	4	-	-	50	20	50	20
AEC - English			Refer University basket	1	1	-	-	50	20	50	20
AEC – MIL			Refer University basket	1	1	-	-	50	20	50	20
VEC			Refer University basket	2	2						
CC			Separate SOP will be released	2	4						
TOTAL				22	32						

*** Important:**

- VSC Should be Complementary to Major/Minor
- SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for SECOND YEAR: SEMESTER – III (Level 5.0)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal			
						Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks
Major	Major-Th. 3	113212	Electronic Devices and Circuits- I	2	2	30	9	20	6	50	20
	Major-Th. 4	113213	Digital Techniques- I	2	2	30	9	20	6	50	20
	Major-Pract. 6	113215	Practical based on Theory 3 & 4	2	2	30	9	20	6	50	20
	IKS-Th.	113214	Evolution of Number System in Ancient India	2	2	30	9	20	6	50	20
Minor	Minor-Th. 3	113216	Electronic Circuits and Digital Techniques- I	2	2	30	9	20	6	50	20
	Minor-Pract. 7	113217	Practical based on Electronic Circuits and Digital Techniques- I	2	4	25	10	25	10	50	20
GOEC	GOEC-5	113218	Solar Power Plant Installation and Maintenance	2	2	30	9	20	6	50	20
VSC	VSC-Pract. 8	113219	Advanced Practical on Major Electronics	2	4	-	-	50	20	50	20
FP/CES	FP/CES	113220	Electronics Lab (FP/ CEP in Electronics - I)	2	4	-	-	50	20	50	20
CC	CC		Separate SOP shall be consulted from University website	2	4	-	-	50	20	50	20

Important: * VSC Should be Complementary to Major

** SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for SECOND YEAR: SEMESTER – IV (Level 5.0)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical				Theory/Pract (Total)	
						External		Internal		Max. Marks	Min. Marks
						Max. Marks	Min. Marks	Max. Marks	Min. Marks		
Major	Major-Th. 5	113221	Electronic Devices and Circuits-2	2	2	30	9	20	6	50	20
	Major-Th. 6	113222	Digital Techniques-2	2	2	30	9	20	6	50	20
	Major-Th. 7*	113230	Microprocessor 8085 & 8086	2	2	30	9	20	6	50	20
	Major-Pract. 9	113223	Practical based on Theory 5, 6 & 7	2	4	25	10	25	10	50	20
Minor	Minor-Th. 4	113224	Electronic Circuits and Digital Techniques-II	2	2	30	9	20	6	50	20
	Minor-Pract. 10	113225	Practical on Minor Theory 4	2	4	25	10	25	10	50	20
GOEC	GOEC-6	113226	Basics of Biomedical Instrumentation	2	2	30	9	20	6	50	20
VSC	VSC-Pract. 11	113227	Advanced Practical on Major Theory 5, 6 & 7	2	4	-	-	50	20	50	20
SEC	SEC-P [#]	113228	Skilling Botanists for Nursery and Garden Management (Discontinued from 2026-27)	2	4	-	-	50	20	50	20
FP/CES	FP/CES	113229	Electronics Lab (FP/ CEP in Electronics - II)	2	4	-	-	50	20	50	20
CC	CC		Separate SOP shall be consulted from University website	2	4	-	-	50	20	50	20

* To be implemented w.e.f. academic session 2026-27 # - Only applicable up to academic session 2025-26

Important: VSC Should be Complementary to Major and SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

TLE Scheme for THIRD YEAR: SEMESTER – V (Level 5.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical Marks				Theory/Pract (Total) Marks	
						External		Internal			
						Max.	Min.	Max.	Min.	Max.	Min.
Major	Major-Th. 8	113231	Measuring Instruments	2	2	30	9	20	6	50	20
Major	Major-Th. 9	113232	Communication Electronics	2	2	30	9	20	6	50	20
Major	Major-Th. 10	113233	C-Programming	2	2	30	9	20	6	50	20
Major	Major-Pract. 12	113234	Practical based on Theory 113231, 113232 & 113233	2	4	25	10	25	10	50	20
Major	Major-Elective Th. 1	113235	Circuit Design & Simulation	2	2	30	9	20	6	50	20
Major	Major-Elective Pract. 13 A	113236	Practical based on Theory 113235	2	4	25	10	25	10	50	20
OR											
Major	Major-Elective Th. 2	113237	E-Vehicle Technology	2	2	30	9	20	6	50	20
Major	Major-Elective Pract. 13 B	113238	Practical based on Theory 113237	2	4	25	10	25	10	50	20
Minor	Minor-Th. 5	113239	Communication & Microprocessor 8086	2	2	30	9	20	6	50	20
Minor	Minor-Pract. 14	113240	Practical based on 113239	2	4	25	10	25	10	50	20
VSC	VSC-Pract. 15	113241	Advanced Practical on Major Theory T8, T9 and T10	2	4	-	-	50	20	50	20
SEC	SEC-Pract. 16	113242	Skill based Practical on Major Theory T8, T9 and T10	2	4	-	-	50	20	50	20
FP/CEP	FP/CEP	113243	Electronics Lab (Field Project / Community Engagement Program)	2	4	-	-	50	20	50	20
Non Credit	Non Credit		Foundation of Artificial Intelligence	NC	2			30+20	9+6	50	20

Important:

- **VSC Should be Complementary to Major**
- **SEC must be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor**
- As per Sant Gadge Baba Amravati University, Amravati Extra-Ordinary Notification No. No. 241/2025 Dated 24/12/2025 “Foundation of Artificial Intelligence” is the Mandatory **Non-Credit Course** compulsory course for all the UG students in fifth semester of all undergraduate programs of all faculties in Sant Gadge Baba Amravati University, Amravati to earn their degree
- NC is Non-Credit Course
- Students must select **Any One** of the Major-Elective Course (T1 & T2) with respective Practical Course in Semester V and **same shall be continued** for Semester VI

TLE Scheme for THIRD YEAR: SEMESTER – VI (Level 5.5)

The Vertical	Type of the Course	Course Code	Course Title	Credits	Workload	Theory/Practical Marks				Theory/Pract (Total) Marks	
						External		Internal			
						Max.	Min.	Max.	Min.	Max.	Min.
Major	Major-Th. 11	113244	Microcontroller 8051	2	2	30	9	20	6	50	20
Major	Major-Th. 12	113245	Sensors and Actuators	2	2	30	9	20	6	50	20
Major	Major-Th. 13	113246	Arduino Programming	2	2	30	9	20	6	50	20
Major	Major-Pract. 17	113247	Practical based on Theory 113244, 113245 & 113246	2	4	25	10	25	10	50	20
Major	Major-Elective Th. 3	113248	Introduction to Internet of Things	2	2	30	9	20	6	50	20
Major	Major-Elective Pract. 18A	113249	Practical based on Theory 113248	2	4	25	10	25	10	50	20
OR											
Major	Major-Elective Th. 4	113250	Python Programming	2	2	30	9	20	6	50	20
Major	Major-Elective Pract. 18B	113251	Practical based on Theory 113250	2	4	25	10	25	10	50	20
Minor	Minor- Th. 6	113252	Microcontroller & Sensors	2	2	30	9	20	6	50	20
Minor	Minor- Pract. 19	113253	Practical based on Minor Theory 113252	2	2	30	9	20	6	50	20
VSC	VSC-Pract. 20	113254	Advanced Practical on Major 113244, 113245 & 113246	2	4	-	-	50	20	50	20
CC	Internship / Apprenticeship (OJT)	113255	Electronics Lab (Internship / Apprenticeship)	4	8	-	-	50	20	50	20

Important: VSC Should be Complementary to Major and SEC has to be selected from the Basket Provided by University, from the same Faculty/Discipline of the Major/Minor

SWAYAM/ NPTEL Courses under NEP 2020

S.No	Sem ester	Course title	Course code*	Credits**	Institution	Agency	Enrolment ends	Link to enroll
1	I	Semiconductor Devices to Sensors: Principles, Design, and Application	noc26-ee101	2/3	IIT Madras	NPTEL	July 20,2026 October 9,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee101&sa=D&source=editors&ust=1784720297440209&usg=AOvVaw0rR-3tu2OPE_y6BQUgh-5W
2	I	Introduction to Semiconductor Devices	noc26-ee139	2/3	IIT Hyderabad, IIT Madras		October 9,2026, October 16,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee139&sa=D&source=editors&ust=1784720297473104&usg=AOvVaw3PK7bAO_DNKX7ZSOQ2Nq9I
3	II	Digital Switching - I	noc26-ee114	2/3	IIT Kanpur	NPTEL	September 11,2026. September 19,2026.	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee114&sa=D&source=editors&ust=1784720297454555&usg=AOvVaw36RhZ1_7XpdWMkusy3NxZR
4	II	Digital Circuits	noc26-ee177	2/3	IIT Kharagpur	NPTEL	October 9,2026, October 24,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee177&sa=D&source=editors&ust=1784720297505517&usg=AOvVaw08lkkzKGiQWiE9hHECYj4t
5	III	Analog Electronic Circuit	noc26-ee135	2/3	IIT Delhi	NPTEL	October 9,2026, October 18,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee135&sa=D&source=editors&ust=1784720297470979&usg=AOvVaw3SpGwtpDB3R5x4LQF1zAoS
6	III	Digital Image Processing	noc26-ee178	2/3	IIT Kharagpur	NPTEL	October 9,2026, October 23,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee178&sa=D&source=editors&ust=1784720297506207&usg=AOvVaw1VWW57apV2flhqdU73zdBA
7	IV	Analog and Digital communications II	noc26-ee94	2/3	IIT Guwahati	NPTEL	October 9,2026, October 23,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee94&sa=D&source=editors&ust=1784720297522209&usg=AOvVaw3Xp-m7gVymDKBUQvO4VEep
8	IV	Fundamentals of Wireless Communication	noc26-ee112	2/3	IIIT Delhi	NPTEL	September 11,2026. September 19,2026.	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee112&sa=D&source=editors&ust=1784720297451621&usg=AOvVaw3-JgNvyWgtlTh6CEORKelo
9	V	Electronic Systems Design: Hands-on Circuits and PCB Design with CAD software	noc26-ee187	2/3	IIT Delhi	NPTEL	October 9,2026, October 16,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee187&sa=D&source=editors&ust=1784720297512216&usg=AOvVaw1cc9-h0JZV67LIFaPHS7vS
10	V	Artificial Intelligence: Foundations and Algorithms	noc26-cs182	2/3	IIT Delhi	NPTEL	October 9,2026, October 25,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs182&sa=D&source=editors&ust=1784720297377992&usg=AOvVaw14oiJWeuvaFbT2D5PBjsUa

11	VI	Foundations of Machine Learning	noc26-cs102	2/3	IIT Hyderabad, IIT Madras	NPTL	October 9.2026, October 18,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs102&sa=D&source=editors&ust=1784720297312416&usg=AOvVaw0FflufMwGIWJycHjIYGKf
12	VI	Electric Vehicle: Its Components, Charging Infrastructure and Grid Integration Solution	noc26-ee103	2/3	IIT Roorkee	NPTL	October 9.2026, October 16,2026	https://www.google.com/url?q=https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ee103&sa=D&source=editors&ust=1784720297441930&usg=AOvVaw3ltCrn8k5K9QnKC7LxaZII

* **Course codes may vary according to the year and session of enrollment**

** **Credits will be awarded as per provisions of the SWAYAM/NPTEL at the time of actual enrollment.**

Mahadnyandeep Online Courses in Electronics:

S. N. (From the provided list)	Level (Data Science, AI and Emerging Technologies)	Title of Course	NSQF	Category
60	D	AI & ML Basics	5	SEC
62	D	AI Tools and Generative AI Applications	6	SEC
68	D	Robotics and IoT Fundamentals	5	SEC
69	D	Future Skills and Emerging Technologies	5	MDC
70	D	Power BI Fundamentals	5	MDC
80	D	Google Cloud / AI	6	MDC

Instructions for Enrollment in SWAYAM/NPTEL Courses under NEP 2020

All students of **B.Sc. with Electronics as Major or Minor** of all semesters are encouraged to enroll in suitable SWAYAM/NPTEL online courses to enhance their academic knowledge, practical skills, and employability.

General Instructions

1. Students may choose any course of their interest listed in table above for specific semester.
2. Before enrollment, students must ensure that they have an active Academic Bank of Credits (ABC) ID. The same ABC ID should be used while registering for the selected SWAYAM/NPTEL course so that earned credits can be deposited in the Academic Bank of Credits.
3. Students should carefully read the course details including duration, eligibility, syllabus, examination schedule, and credit structure before enrolling.
4. Merely enrolling in a course does not make a student eligible for academic credits. Students must:
Complete the course requirements, appear for the proctored examination, and successfully pass the examination as per the norms prescribed by SWAYAM/NPTEL.
5. Credits will be awarded only after successful completion and certification of the course by the concerned agency.
6. Every student must submit the details of the enrolled course to the Department of Electronics immediately after registration.
7. Submission of enrollment details to the Department is mandatory to facilitate record maintenance and compliance with University requirements regarding credit transfer and academic documentation.
8. Students are advised to preserve all course-related documents, including Enrollment confirmation, Course progress records, Examination registration receipt, Score card, Final certificate.
9. Students shall be responsible for timely registration for the examination, payment of examination fees (if applicable), and completion of all course requirements within the stipulated period.
10. The Department of shall not be responsible for missed deadlines, incomplete registrations, examination non-appearance, or failure to satisfy the certification requirements of the concerned SWAYAM/NPTEL course.
11. After successful completion of the course, students must submit a copy of the course certificate and score card to the Department of Electronics for further processing and reporting to the University.