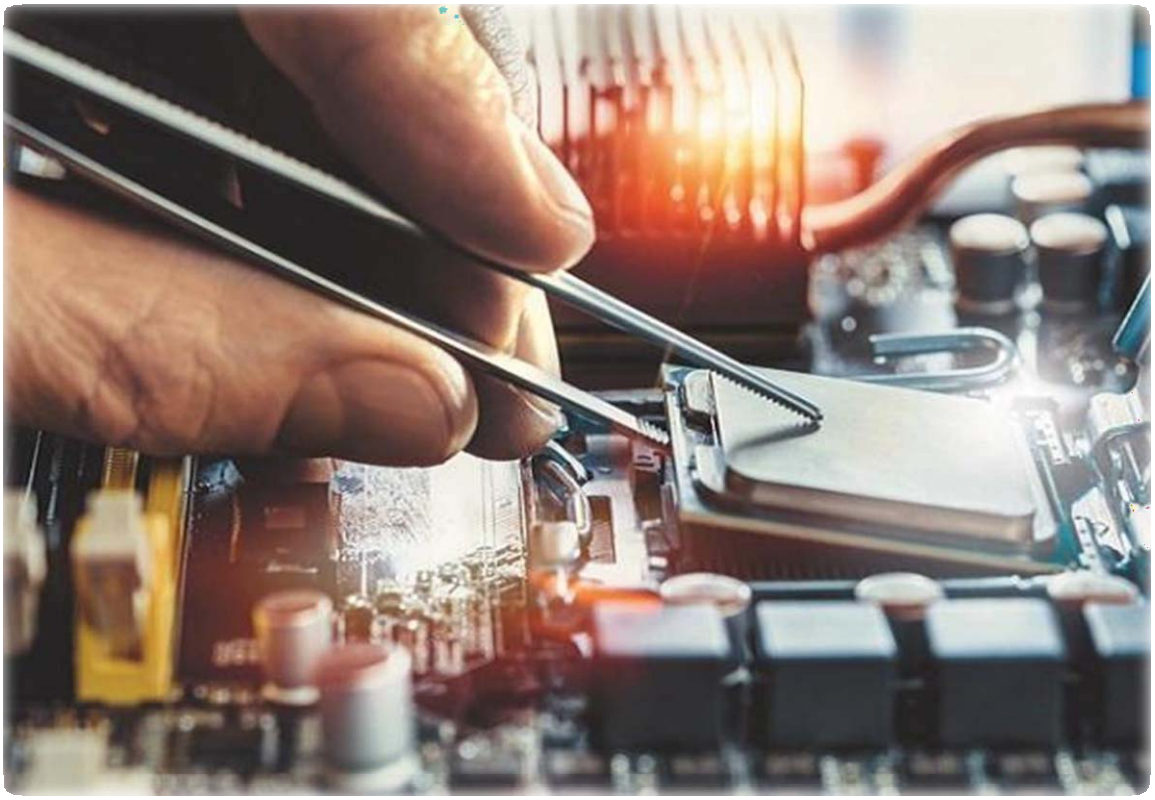
Government of Karnataka

Curriculum Framework for Four-Year Undergraduate Multidisciplinary Programme (Honours) & Master Programme in Colleges and Universities of Karnataka State Under NEP 2020.



4th Semester Model Syllabus for BSc. in Electronics

Submitted to
Vice Chairman
Karnataka State Higher Education Council
30, Prasanna Kumar Block, Bengaluru City University Campus,
Bengaluru, Karnataka – 560009

Composition of Subject Expert Committee Members

SN	Name & Organization	Designation
1	Dr. S. V. Halase, Vice Chancellor, Davanagere University, Davanagere.	Chairman
2	Dr. Mahadev Prasad M Professor, University of Mysore, Mysuru.	Member
3	Dr. J.T. Devaraj, Registrar (Evaluation) Professor, Bangalore University, Bengaluru.	Member
4	Dr. Airani Mohammed Khan Professor, Mangalore University, Konaje.	Member
5	Dr. P.V. Hungund (AE) Professor, Gulbarga University, Kalaburgi	Member
6	Dr. Gurucharan Garud Assoc. Professor, Nrupathunga University, Bengaluru.	Member
7	Shri Ravishankar, Assoc. Professor Maharani's Science College for Women, Mysuru	Member
8	Shri Anoop Theophilus Assoc. Professor, GFGC, Dharwad.	Member
9	Smt. Krishnaprabha Assoc. Professor, Govt. College, Car Street, Mangalore.	Member
10	Dr. Jayappa M. Special Officer, Karnataka State Higher Education Council	Member Convener

Special Invitees	
1	Dr. Nagesh
2	Dr. Anil Kumar Chikmanur
3	Dr. Manjesh,

Model Curriculum
of
BSc Honours
in
Electronics

4th Semester

Karnataka State Higher Education Council

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Model Curriculum

Program Name	**BSc in Electronics**	Semester	**Fourth Semester**
Course Title	**Electronic Communication-I (Practical)**		
Course Code:	**ELE CP 4.1**	No. of Credits	**2**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**
Note: Minimum of 10 Experiments are to be performed using hardware and simulation.			

List of Experiments	
1.	Construct amplitude modulator using transistor / I. C. Determination the modulation index.
2.	Construct frequency modulator circuit – determine the modulation index.
3.	"AM" Liner Diode detector- trace the input and output waveforms.
4.	Frequency mixer circuit – Verify output frequency for different input frequencies.
5.	"FM" Detector – Plot the frequency response curve.
6.	Study of Balanced demodulator
7.	Study of IF amplifier circuit.
8.	Pulse amplitude modulation (PAM) – trace the output waveforms.
9.	Pulse width modulation (PWM) – trace the output waveforms.
10.	Pulse position modulation (PPM) – trace the output waveforms.
11.	Characteristics of LED in OFC
12.	Study of Numerical aperture
13.	Study of OFC losses.
14.	Setting up simple OFC Link.

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Model Curriculum

Program Name	**BSc in Electronics**	Semester	**Fourth Semester**
Course Title	**Application of Electronics-2 (Theory)**	No. of Credits	**3**
Course Code:	**ELE OE 4.1**	Contact hours	**45 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

OE Paper is to be offered for the Students other than Science stream*

***This Paper (ELE OE 4.1) is offered by any Stream Students.**

Theory Contents	
Unit–1: Introduction to Advanced Communication	12 Hrs
Radio, TV- principles, block diagram & applications OFC applications and advantages, Embedded system – Smart card, SIM card Mobiles- Bock diagram &applications	
Unit -2: Advance Electronics	12 Hrs
CCTV camera, ATM- principles, block diagram & applications Electronic voting Machine (EVM)- CU,BU,VVPAT.,	
Unit -3: Application of Satellite	11 Hrs
Types, EDUSAT, TV & Internet-modem, Wi-Fi.	
Unit -4: E-waste management	10 Hrs
E-waste management-identification, segregation, disposal	

References	
1	Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd

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Model Curriculum

Program Name	**BSc in Electronics**	Semester	**Fourth Semester**
Course Title	**Augmented and Virtual Reality (Theory)**	No. of Credits	**3**
Course Code:	**ELE OE 4.2**	Contact hours	**45 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit–1: Introduction to Virtual Reality	10Hrs
Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input & output- Visual, Aural & Haptic Displays, Applications of Virtual Reality.	
Unit -2: Augmented Reality	10 Hrs
AR: Taxonomy, technology and features of augmented reality, difference between AR and VR, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality.	
Unit -3: The Geometry of Virtual Worlds &The Physiology of Human Vision	12 Hrs
Geometric Models, Changing Position and Orientation, Axis-Angle Representations of Rotation, Viewing Transformations, Chaining the Transformations, Human Eye, eye movements & implications for VR. #Exemplar/ Case Studies Sweeping coverage of eye movements	
Unit -4: Visual Perception & Rendering and Motion & Tracking	13 Hrs
Visual Perception - Perception of Depth, Perception of Motion, Perception of Color, Combining Sources of Information Visual Rendering -Ray Tracing and Shading Models, Rasterization, Correcting Optical Distortions, Improving Latency and Frame Rates #Exemplar/ Case Studies Automatic stitching of panoramas in Virtual Reality. Motion in Real and Virtual Worlds- Velocities and Accelerations, The Vestibular System, Physics in the Virtual World, Mismatched Motion and Vection Tracking- Tracking 2D & 3D Orientation, Tracking Position and Orientation, Tracking Attached Bodies.	

References	
1	E. Balagurusamy, - Computing Fundamentals and C Programming‖, Tata McGraw-Hill, 2008.
2	Anand R., “Augmented and Virtual Reality”, Khanna Publishing House, Delhi.

References	
3	R.G.Dromey, How to Solve by Computer, Pearson Education, Inc, Reprint 2009.
4	Yashavant P. Kanetkar, ―Let Us C, Fifth Edition, Sridhara Publication, India, 2008.

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Model Curriculum

Program Name	**BSc in Electronics**	Semester	**Fourth Semester**
Course Title	**IOT and Applications (Theory)**	No. of Credits	**3**
Course Code:	**ELE OE 4.3**	Contact hours	**45 Hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**
OE Paper is to be offered for the Students other than Electronics stream			

Theory Contents	
Unit–1:	12 Hrs
Fundamentals of IoT: Introduction, History of IoT, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, Components of an IoT Solution, IoT frameworks, IoT and M2M, Open Source and Commercial Examples, Competing Standards for IoT	
Unit -2:	12 Hrs
Sensors Networks: Definition, Traditional Data Storage, Analog and Digital I/O Basics, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.	
Unit -3:	11 Hrs
Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet, Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols	
Unit -4:	10 Hrs
Data Handling& Analytics: Introduction, Bigdata, Types of data, Characteristics of Big data, Data handling Technologies, Flow of data, Data acquisition, Data Storage Applications of IoT: Home Automation	

References	
1	Internet of Things, Vasudevan, Nagrajanand and Sundaram, Wiley India.
2	Srinivasa K G “Internet of Things”, Cengage Learning, India 2017.

References	
3	David Hanes, Gonzalo Salgueiro, Patrick Grosstete, Robert Barton, Jerome Henry, IoT fundamentals: Networking Technologies, Protocols and uses cases for the Internet of things, 1st Edition, Pearson Education.
4	Iot Fundamentals, David Hence et al, Cisco press.