



**Dr.M.G.R.**  
**Educational and Research Institute**  
**(DEEMED TO BE UNIVERSITY)**  
 (An ISO Certified Institution)  
 University with Graded Autonomy Status  
 Maduravoyal , Chennai - 600 095



## DEPARTMENT OF ELECTRONIC SCIENCES

### B.Sc ELECTRONICS

Curriculum & Syllabus - 2018-Regulation

SEMESTER I					
Sub. Code	Subject Name	L	T	P	C
HBTA17001	Tamil - I / Hindi - I / French - I	3	0	0	3
HBEN17001	English - I	3	0	0	3
HBMA17A01	Allied - I : Mathematics - I	3	1	0	4
HBEC18001	Electronic Devices	3	1	0	4
HBEC18002	Circuit Theory	3	1	0	4
HBEC18L01	Electronic Devices Lab	0	0	6	2
<b>1<sup>st</sup> Semester Credits</b>					<b>20</b>

SEMESTER II					
Sub. Code	Subject Name	L	T	P	C
HBTA17002	Tamil - II / Hindi - II / French - II	3	0	0	3
HBEN17002	English - II	3	0	0	3
HBMA17A02	Allied - I : Mathematics - II	3	1	0	4
HBEC18003	Electronic Circuits	3	1	0	4
HBEC18004	Basics of PCB Design	3	1	0	4
HBEC18L02	Electronic Circuits Lab	0	0	6	2
<b>2<sup>nd</sup> Semester Credits</b>					<b>20</b>

SEMESTER III					
Sub. Code	Subject Name	L	T	P	C
HBCS17C03	Allied - II : Object Oriented Programming	3	1	0	4
dHBEC18005	Digital Electronics	3	1	0	4
HBEC18006	Analog Communication	3	1	0	4
HBEC18007	Linear Integrated Circuits	3	1	0	4
HBEC18008	Introduction to IoT	3	1	0	4
HBEC18L03	Digital Electronics Lab	0	0	6	2
HBMG17L01	Soft Skills - I	0	1	1	2
<b>3<sup>rd</sup> Semester Credits</b>					<b>24</b>

*B.Sc Electronics – 2018 Regulation*



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SEMESTER IV					
Sub. Code	Subject Name	L	T	P	C
HBCS17C04	Allied - II : Data Structures	3	1	0	4
HBEC18009	Microprocessor and Microcontroller	3	1	0	4
HBEC18010	Digital Communication	3	1	0	4
HBCS17C08	Computer Networks	3	1	0	4
HBEC18L04	Microprocessor and Microcontroller Lab	0	0	6	2
HBEC18L05	Analog Communication lab	0	0	6	2
HBMG17L02	Soft Skills - II	0	1	1	2
4 <sup>th</sup> Semester Credits					22

SEMESTER V					
Sub. Code	Subject Name	L	T	P	C
HBEC18011	Introduction to Signal Processing	3	1	0	4
HBEC18EXX	Elective - I	3	1	0	4
HBEC18012	Wave Propagation and Antenna Theory	3	1	0	4
HBMG17001	Environmental Studies	3	0	0	3
HBEC18EXX	Elective - II	3	1	0	4
HBEC18L06	Digital Communication Lab	0	0	6	2
HBEC18L07	Signal Processing Lab	0	0	6	2
5 <sup>th</sup> Semester Credits					23

SEMESTER VI					
Sub. Code	Subject Name	L	T	P	C
HBMG17G01	Entrepreneurial Development	3	0	0	3
HBEC18EXX	Elective - III	3	1	0	4
HBEC18013	Introduction to VLSI	3	1	0	4
HBEC18L08	Project	0	0	12	10
6 <sup>th</sup> Semester Credits					21



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Elective Subjects					
Sub. Code	Subject Name	L	T	P	C
HBEC18E01	Nano Electronics	3	1	0	4
HBEC18E02	Sensor Networks and Instrumentation	3	1	0	4
HBEC18E03	Industrial Electronics	3	1	0	4
HBEC18E04	Mechatronics	3	1	0	4
HBEC18E05	Information Coding Theory	3	1	0	4
HBEC18E06	Cryptography	3	1	0	4
HBEC18E07	Medical Electronics	3	1	0	4
HBEC18E08	Robotics	3	1	0	4

### Credit Requirements:

I Year - (I & II Sem)                      - 20 + 20      =    40

II Year - (III & IV Sem)                   - 24 + 22      =    46

III Year - (V & VI Sem)                   - 23 + 21      =    44

**Total Credit Requirement                      =    130**



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(Declared U/S 3 of the UGC Act 1956)  
**B.B.A., BCA., B.Sc., B.Com முதல் பருவம்**

தேர்தல்கள்:

- வாய்மொழி இலக்கியத்தையும் செய்யுள் இலக்கியத்தையும் அறிந்து கொள்ளல்
- சிறுகதை மரபினைப்பற்றித் கொள்ளல்
- பிழைஇன்றித்தமிழ் எழுதுவதற்கு அடிப்படை இலக்கணத்தைப்பயிற்றுவித்தல்
- கவிதை மரபினையும் சிறுகதை மரபினையும் வரலாற்று நிலையிலிருந்து விளக்குதல்

**தமிழ் - தாள் I**

அலகு - 1

1. தாலாட்டு
2. காதல்
3. ஒப்பாரி
4. காணிநிலம் வேண்டும் - பாரதி
5. நல்லதேவர் வீணை - பாரதி
6. தமிழ்க்காதல் - பாரதிதாசன்
7. தமிழ்வளர்ச்சி - பாரதிதாசன்
8. எந்நாளோ? - பாரதிதாசன்
9. ஆறு தன் வரலாறு கூறுதல் - கவிமணி தேசிய விநாயகம் பிள்ளை

அலகு - 2

1. வழித்துணை - நயிச்சமுத்தி
2. குருடர்களின் யானை - அப்துல்ரகுமான்
3. முள் முள் முள் - சிற்பி

அலகு - 3 புதுமைப்பித்தன் கதைகள்

1. கடவுளும் கத்தாமிப் பிள்ளையும்
2. செல்லம்மாள்
3. துன்பக்கேணி
4. ஆற்றங்கரைப் பிள்ளையார்
5. ஒருநாள் கழிந்தது

அலகு - 4

1. பெயர், வினை, இடை, உரிச்சொற்களின் பொது இலக்கணம், வலியுறுத்தும் இடங்கள், வலியுறுத்தும் இடங்கள்.

அலகு - 5

1. தமிழ்க் கவிதையின் தோற்றமும் வளர்ச்சியும் (மரபுக்கவிதை, புதுக்கவிதை)
2. தமிழ்ச்சிறுகதையின் தோற்றமும் வளர்ச்சியும் (மரபுத் தொடர்கள், பொருத்தியசொல் தருதல் கலைச் சொற்கள், நேர்காணல்)

*சுப்பிரமணியம்*  
*சுப்பிரமணியம்*

மேற்பார்வை தலைவர்:

Vice Chancellor  
Dr. M.G. சென்னைப் பல்கலைக்கழக வெளியீடு - 2013  
EDUCATIONAL AND RESEARCH INSTITUTE  
UNIVERSITY  
(Declared U/S 3 of the UGC Act 1956)  
Periyar E.V.R. High Road,  
Maduravoyal, Chennai - 600 095

துணைவேந்தர், தமிழ்நாடு

செயல்பாட்டிற்கு:

*சுப்பிரமணியம்*

Prof. Dr. S. DINAKARAN  
JOINT REGISTRAR  
Dr. M.G.R.  
Educational and Research Institute  
University  
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Periyar E.V.R. High Road  
Maduravoyal, Chennai - 600 095

தமிழ்த்துறைத் தலைவர்

டாக்டர் எம்.ஜி.ஆர்.  
கல்வி மற்றும் ஆராய்ச்சி நிறுவனம்  
பல்கலைக்கழகம்  
மதுரவாயல், சென்னை - 600 095



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BHI13001

HINDI - I

3 0 0 3

Prose, Administrative Hindi and Grammar.

### UNIT I

9 Hrs

1. Sabhyata ka rahasya - lesson and annotations ,Questions & answers,
2. Administrative terms ( Prayojan mulak Hindi)

### UNIT II

9 Hrs

1. Mitratha ka rahasya - lesson and annotations questions and answers
2. Patra lekhan, definitions, correspondence in hindi

### UNIT III

9 Hrs

1. Paramanu oorja evam and kadiya sanrakshan (lesson ) annotations and answers,
2. Technical terms and words, letter writing

### UNIT IV

9 Hrs

1. Yuvavon se (lesson), annotations, essay and questions and answers
2. Types of official correspondence, technical terms
3. Grammar(Change of voice, correcting the sentences)

### UNIT V

9 Hrs

1. Yogyata aur vyavasay ka chunav (Lesson) essay, questions and answers
2. Letter writing
3. grammar & technical terms

Total no of Hrs: 45

### REFERENCES

- ❖ Dr. Syed Rahmatullah & Poornima Prakashan, *Hindi gadiya masala*
- ❖ Dr. Syed Rahmatullah & Poornima Prakashan, *Prayojanmulak Hindi*
- ❖ Dakshin Bharat Hindi Prachara Sabha, T.Nagar, *Saral Hindi Vyakaran-2*

*Sam*



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## **DEPARTMENT OF ELECTRONIC SCIENCES**

### **Syllabus for French**

#### **Semester I – French - I**

##### **Unit 1**

###### ***Découvrir la langue française***

- Se présenter, dire si on comprend, présenter une personne, nommer les choses, savoir vivre, comprendre la grammaire

##### **Unit 2**

###### ***Faire connaissance***

- Donner des informations sur une personne, demander, exprimer ses préférences, parler de son travail, parler de ses activités, parler de son pays, de sa ville

##### **Unit 3**

###### ***Organiser son temps***

- Dire la date, dire l'heure, donner des informations sur un emploi du temps, proposer-accepter-refuser, interroger-répondre, faire un programme d'activités

##### **Unit 4**

###### ***Découvrir son environnement***

- S'orienter, Situer, Se loger, Exprimer la possession, Connaître les rythmes de vie, Fixer des règles

##### **Unit 5**

###### ***S'informer***

- Dire ce qu'on fait, S'informer sur un emploi du temps passé, Expliquer, Exprimer la doute ou la certitude, Découvrir les relations entre les mots, Savoir s'informer

Recommended book :

Campus 1 – méthode de française by Jacky Girardet, Jacques Pécheur

*S. Mani*  
13/06/2017  
S. MANI NESSACAI





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Maduravoyal, Chennai - 95  
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**Faculty of Humanities and Science**  
**Department of English**  
**Syllabus for English**  
**Semester I Paper I**

**Common to All UG Courses (H&S)**

(i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networking), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. ( Physics), B.Sc. (Chemistry) etc)

**Proposed for implementation from the Academic Year 2017-2018**

Code: HBEN15001

**L T P C**

**3 0 0 3**

### UNIT I

Prose: Literary Landscapes (Orient Black Swan)

### UNIT II

Poetry:\* Literary Landscapes (Orient Black Swan)

### UNIT III

Short Stories: Literary Landscapes (Orient Black Swan)

### UNIT IV

One Act Plays: Literary Landscapes (Orient Black Swan)

### UNIT V

Functional English

**Total:**

**45 Periods**

*R. Anitha*

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## DEPARTMENT OF ELECTRONIC SCIENCES

### SEMESTER I

From the Academic Year 2017-2018

#### COURSE OBJECTIVES:

1. to prepare students for attaining a comprehensive knowledge of the communication skills
2. to make them understand the nuances of the language and use its vocabulary in appropriate contexts
3. to develop in students a knowledge of the various techniques in language use
4. to develop in them analytical and interpretative skills
5. to train learners in organized academic and business writing

#### Unit I-PROSE- For Detailed Study

1. On Running After One's Hat
2. The Unexpected
3. How to be a Doctor

G.K. Chesterton  
Robert Lynd  
Stephen Leacock

#### Unit II- POETRY- For Detailed Study

1. Ulysses
2. If
3. Leave this Chanting and Singing

Lord Tennyson  
Rudyard Kipling  
Rabindranath Tagore

#### Unit III- SHORT STORY

1. A Retrieved Reformation
2. Engine Trouble

O'Henry  
R.K. Narayan

#### Unit IV – GLIMPSES FROM GREAT MINDS

1. I lived with words
2. My Vision for India

R.L. Stevenson  
Dr. APJ Abdul Kalam

#### Unit V - FUNCTIONAL ENGLISH

Enhancing LSRW Skills through Tasks

Note: Each lesson to be followed by text-based Vocabulary, Grammar, and Usage

#### Exercises

Synonyms, Antonyms- Affixes ( prefixes & Suffixes)-Noun- Adjectives, Verb, Tense, Adverb, Preposition, 'if' clause, Articles, discourse markers, Reported and Direct speech- Voice, Degrees of comparison, Interrogatives  
Comprehension, Précis writing

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## DEPARTMENT OF ELECTRONIC SCIENCES

### COURSE LEARNING OUTCOME:

Students completing the General English course

1. will be able to attain comprehensive knowledge of the four skills of communication viz.LSRW
2. will be able to understand the nuances of English Language as use its vocabulary in appropriate contexts
3. will have acquired the knowledge of the various techniques in language usage
4. will have acquired proficiency in analytical and interpretative skills
5. will be trained in organized and academic and business writing

Text Prescribed: Pushkala R, Padmasani Kannan, Chandrasena Rajeswaran, Anuradha V  
**Literary Landscapes**, Orient Black Swan, 2017

### Text Books, Reference Books and Web Resources

1. Pushkala R, P.A.Sarada, El Dorado: A Textbook of Communication Skills, Orient Blackswan, 2014
2. Padmasani Kannan.S., Pushkala.R. : Functional English
3. Hancock, Mark, English Pronunciation in Use; Cambridge Univ. Press, 2013
4. McCarthy, Michael et.al., English Vocabulary in Use, Advanced, Cambridge Univ. Press, 2011
5. Wren and Martin: Grammar and Composition, Chand & Co, 2006
6. Part I& Part II from Spring Board by Orient Black Swan Pvt. Ltd.
7. <https://learnenglish.britishcouncil.org>
8. [www.englishpage.com](http://www.englishpage.com)
9. [www.writingcentre.uottawa.ca/hypergrammar/preposit.html](http://www.writingcentre.uottawa.ca/hypergrammar/preposit.html)
10. [www.better-english.com/grammar/preposition.html](http://www.better-english.com/grammar/preposition.html)
11. <http://www.e-prammar.org/infinite-gerund/>
12. [www.idiomsite.com/](http://www.idiomsite.com/)

*R. Pushkala*

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<b>HBMA17A01</b>	<b>ALLIED MATHEMATICS I</b>	<b>3104</b>
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- 1) Vittal.P.R, *Allied Mathematics*, Margham Publications., Chennai,(2012).
- 2) Venkatachalapathy.S.G, *Allied Mathematics*, Margham Publications., Chennai,(2007).
- 3) Singaravelu, *Allied Mathematics*, Meenakshi Agency., Chennai,(2001).
- 4) Gupta S.C., Kapoor V.K., *Fundamentals of Mathematical Statistics*, S.Chand & Co.,(2007).
- 5) Vittal.P.R, Malini, *Statistical & Numerical Methods*, Margham Publications., Chennai,(2012).



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18001</b>	<b>ELECTRONIC DEVICES</b>	<b>3 1 0 4</b>
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### **UNIT-I SEMICONDUCTOR DIODE 12**

Theory of PN Junction Diode – VI characteristics – Static and Dynamic Resistance Effect of Temperature on Diodes – Zener Diode – Avalanche and Zener Break Down Mechanisms – Zener Diode as a Voltage Regulator.

### **UNIT-II BIPOLAR JUNCTION 12**

NPN - PNP – Junctions - Early effect - Current equations – Input and Output characteristics of CE, CB CC– Transistor Biasing – Bias Stabilization – Bias Compensation.

### **UNIT-III FIELD EFFECT TRANSISTORS 12**

Construction Feature & Working Principles of JFET, MOSFET Depletion and Enhancement Mode, Biasing of FET.

### **UNIT-IV SPECIAL SEMICONDUCTOR DEVICES 12**

Schottky barrier diode - Zener diode - Varactor diode – Tunnel diode- Gallium Arsenide device, LASER diode, LDR.

### **UNIT-V POWER DEVICES AND DISPLAY DEVICES 12**

UJT, SCR, DIAC, TRIAC, -. LED, LCD, Photo transistor, Opto Coupler.

**Total no of Hrs: 60**

### **TEXT BOOK:**

1. Donald A Neaman, “Semiconductor Physics and Devices”, Third Edition, Tata Mc GrawHill Inc. 2007.

### **REFERENCE BOOKS:**

1. Yang, “Fundamentals of Semiconductor devices”, McGraw Hill International Edition, 1978.
2. Robert Boylestad and Louis Nashelsky, “Electron Devices and Circuit Theory” Pearson Prentice Hall, 10<sup>th</sup> edition, July 2008.



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18002</b>	<b>CIRCUIT THEORY</b>	<b>3 1 0 4</b>
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### **UNIT-I BASIC CIRCUIT CONCEPTS 12**

V-I Relationships of R, L and C – Independent Sources – Dependent Sources – Kirchhoff's Laws - Simple Resistive Circuits – Network Reduction – Voltage Division – Current Division.

### **UNIT-II AC FUNDAMENTALS 12**

AC Quantity, Phasor Representation – Analysis of Simple Series And Parallel Circuits – Power And Power Factor – Analysis Mesh Current And Node Voltage Methods - Simple problems.

### **UNIT-III NETWORK THEOREMS AND APPLICATIONS 12**

Superposition Theorem – Thevenin's Theorem – Norton's Theorem - Maximum Power Transfer Theorem - Reciprocity Theorem.

### **UNIT-IV THREE PHASE CIRCUITS 12**

Three Phase Systems - Phase Sequence – Solution of Three Phase Balanced Circuits – Solution of Three Phase Unbalanced Circuits.

### **UNIT-V COUPLED CIRCUITS 12**

Mutual Inductance – Coefficient of Coupling -Single & Double Tuned Circuits – Critical Coupling.

**Total No of hrs: 60**

#### **TEXT BOOKS:**

1. Bruce Carlson, "Circuits: Engineering Concepts and Analysis of Linear Electric Circuits", Thomson Learning, 1st Edition, 2002.
2. Artice.M. Davis, "Linear Circuits Analysis", Thomson Learning 2002
3. Sudhakar, A. and Shyam Mohan S.P. "Circuits and Network Analysis and Synthesis", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1994.

#### **REFERENCE BOOKS:**

1. Hyatt, W.H. Jr and Kimmerly, J.E., "Engineering Circuits Analysis", McGraw Hill International Editions, 1993.
2. Edminister, J.A., "Theory and Problems of Electric Circuits", Schaum's Outline Series McGraw Hill Book Company, 2nd Edition, 1983.
3. Paranjothi S.R., "Electric Circuit Analysis", New Age International Ltd., Delhi, 2nd Edition, 2000.



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<b>HBEC18L01</b>	<b>ELECTRONIC DEVICES LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS:**

1. Introduction to Basic ElectronicComponents.
2. Analysis of KVL andKCL.
3. Maximum Power TransferTheorem.
4. Verification of Thevenin'sTheorem.
5. V-I Characteristics of PN JunctionDiode.
6. V-I Characteristics of ZenerDiode.
7. Input-Output Characteristics of Bipolar JunctionTransistor.
8. Input-Output Characteristics of Field EffectTransistor.
9. Characteristics of UJT.
10. Study of Cathode RayOscilloscope.





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## DEPARTMENT OF ELECTRONIC SCIENCES



டாக்டர். எம்.ஜி.ஆர்.  
கல்வி மற்றும் ஆராய்ச்சி நிறுவனம்  
பல்கலைக்கழகம்  
அழகப்பாளையம், சென்னை - 600 095.

FORM NO - 1/EP E.S.T - 7/08 Rev. 00 01/01/2014

தமிழ்த்துறை  
இரண்டாம் பருவம் - தமிழ்த்தாள்-II  
பாடப்பகுதிகள்

அலகு-I

1. சிற்றிலக்கிய வரலாறு
2. கிறித்தவ இலக்கிய வரலாறு
3. இசுலாமிய இலக்கிய வரலாறு

அலகு-II

4. நந்திக் கலம்பகம்
5. முத்தொள்ளாயிரம்
6. தமிழ்விடு தாது

அலகு-III

7. திருக்குறளாலக் குறவஞ்சி
8. முக்தாபுரம்
9. இயேசுரின் பிள்ளைத்தமிழ்

அலகு-IV

10. நளவெண்பா
11. சீறாப்புராணம்

அலகு- V

மொழிப்பயிற்சி : பண்புத்தொகை, விளைத்தொகை, உம்மைத்தொகை, உருவகம், உவமைத்தொகை, வேற்றுமைத்தொகை, அன்மொழித்தொகை, இருபொயிராட்டுப் பண்புத்தொகை.

ஒரு பொருள் குறித்த பலசொல், புல பொருள் குறித்த ஒரு சொல், அகரவரிசைப்படுத்தல், ஒதுமை, பன்மை மயக்கம், பிறமொழிச் சொற்களை நீக்குதல்.

பார்வை நூல்கள் :

1. சென்னைப் பல்கலைக்கழக வெளியீடு-2013
2. பொது இலக்கணம்

சுயாதீன இலக்கணம்  
தமிழ்த்துறை

Vice Chancellor  
Dr. M.G.R.  
EDUCATIONAL AND RESEARCH INSTITUTE  
UNIVERSITY

பி. அனந்தசுந்தர் சிப்பந்தியாக

பி. அழகப்பாளையம்

Prof Dr. S. DINAKARAN  
JOINT REGISTRAR  
Dr. M.G.R.  
Educational and Research Institute  
University  
(Decl. u/s.3 of UGC Act, 1956)  
Periyar E.V.R. High Road  
Maduravoyal, Chennai-600 095

தமிழ்த்துறைத் தலைவர்  
டாக்டர் எம்.ஜி.ஆர்.  
கல்வி மற்றும் ஆராய்ச்சி நிறுவனம்  
பல்கலைக்கழகம்  
மதுராவாயல், சென்னை - 600 095



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University

### New Syllabus

#### **Hindi – Semester II – Paper – II (Poetry, Hindi Computing, Alankar)**

##### Unit – I

1. Poetry – VirPooja, Kaidi aur Kokila – Kavi Parichay, Annotation, Summary  
Makhanlal Chaturvedi

2. Poetry – Kabirdass – Sakhi – Kantasth 01 – 10 (Doha)

3. Alankar – Aupras and Upama only.

##### Unit – II

1. Poetry – Aansu, Shradha ka saundarya Annotation, Kavi Parichay, Summary

2. Poetry – Surdas – Two Padhya

##### Unit – III

1. Poetry – Subramaniya Bharathi – Nachenge – Hum Annotation, Kavi Parichay, Summary

2. Kaam Kaji Hindi Concept of Official Language and Hindi computing theory.

##### Unit – IV

1. Poetry – Galiv – Chunin da ser – Annotation, Summary, Kavi Parichay

2. Computer Internet in Hindi Latest tools and Packages

##### Unit – V

1. Kavi parichay, Jaishan kar Prasad, Subramaniya Bharathi and Mirzagalib, Makhanlalchaturvedi

2. Slesha Alankar

*Ofam*  
(RACHA RAMAKRISHNAN)



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### **Syllabus for French**

#### **Semester II – French - II**

##### **Unit 1**

###### ***Cultiver ses relations***

- Recevoir, Communiquer, Parler des personnes, Donner des informations, écrire, être à l'aise avec les autres

##### **Unit 2**

###### ***Découvrir le passé***

- Parler du passé, raconter les moments d'une vie, parler de la famille, préciser le moment de la durée, parler des habitudes et des changements, connaître quelques repères de l'histoire

##### **Unit 3**

###### ***Entreprendre***

- Parler d'une entreprise, Exprimer un besoin, Parler du futur, Présenter les étapes d'une réalisation, Rapporter des paroles, Faire un projet de réalisation

##### **Unit 4**

###### ***Prendre des décisions***

- Comparer des qualités, Comparer des quantités et des actions, Exprimer la ressemblance ou la différence, Faire des suppositions, Comparer des lieux, Parler de la télévision

##### **Unit 5**

###### ***Faire face aux problèmes***

- Poser un problème, Caractériser une action, Parler de la sante, Interdire-Autoriser, Connaître la vie politique

Recommended book : Campus 1 – méthode de française by Jacky Girardet,  
Jacques Pécheur

R. M. S. M. S.  
12/06/2017  
S. MANINEGALAI



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Faculty of Humanities and science  
Department of English  
Syllabus for English  
Semester II Paper II  
Common to All UG Courses (H&S)

(i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networking), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. ( Physics), B.Sc. (Chemistry) etc)

Proposed for implementation from the Academic Year 2017-2018

Code: HBEN14002

L T P C

3 0 0 3

### UNIT I

Prose: Literary Landscapes (Orient Black Swan)

### UNIT II

Poetry: Literary Landscapes (Orient Black Swan)

### UNIT III

Short Stories: Literary Landscapes (Orient Black Swan)

### UNIT IV

One Act Plays: Literary Landscapes (Orient Black Swan)

### UNIT V

Functional English

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## DEPARTMENT OF ELECTRONIC SCIENCES

Total:

45 Periods

### SEMESTER II FROM THE ACADEMIC YEAR 2017-2018

#### COURSE OBJECTIVES:

1. to prepare students to attain a comprehensive knowledge of the communication skills
2. to make them understand the nuances of the English language and use the vocabulary in appropriate contexts
3. to develop in students a knowledge of the various techniques in language usage
4. to develop in them analytical and interpretative skills
5. to train learners in organized, academic and business writing

#### Unit I- PROSE- For Detailed Study

1. Spoon Feeding
2. Disaster Management
3. If You are Wrong Admit it

W.R. Inge  
B.M. Hegde  
Dale Carnegie

#### Unit II – POETRY- For Detailed Study

1. Psalm of Life
2. Anthem for Doomed Youth
3. Street Cries

H.W. Longfellow  
Wilfred Owen  
Sarojini Naidu

#### Unit III – SHORT STORY

1. How Much Land does a Man Need?
2. Uncle Podger Hangs the Picture

Leo Tolstoy  
Jerome K. Jerome

#### Unit IV - DRAMA

1. Excerpts from The Merchant of Venice
2. Monkey's Paw

William Shakespeare  
W.W. Jacob

#### Unit V – FUNCTIONAL ENGLISH

Enhancing LSRW Skills through Tasks

**Note: Each lesson to be followed by text-based Vocabulary, Grammar, and Usage Exercises**

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### COURSE LEARNING OUTCOME:

Students completing the General English course

1. will be able to attain comprehensive knowledge of the four skills of communication viz.LSRW
2. will be able to understand the nuances of English Language as use its vocabulary in appropriate contexts
3. will have acquired the knowledge of the various techniques in language usage
4. will have acquired proficiency in analytical and interpretative skills
5. will be trained in organized and academic and business writing

Text Prescribed: Pushkala R, Padmasani Kannan, Chandrasena Rajeswaran, Anuradha V  
Literary Landscapes, Orient Black Swan, 2017

### Text Books, Reference Books and Web Resources

1. Pushkala R, P.A.Saradā, El Dorado: A Textbook of Communication Skills, Orient Blackswan, 2014
2. Padmasani Kannan.S., Pushkala.R. : Functional English
3. Hancock, Mark, English Pronunciation in Use; Cambridge Univ. Press, 2013
4. McCarthy, Michael et.al., English Vocabulary in Use, Advanced, Cambridge Univ. Press, 2011
5. Wren and Martin: Grammar and Composition, Chand & Co, 2006
6. Part I& Part II from Spring Board by Orient Black Swan Pvt. Ltd.
7. <https://learnenglish.britishcouncil.org>
8. [www.englishpage.com](http://www.englishpage.com)
9. [www.writingcentre.uottawa.ca/hypergrammar/preposit.html](http://www.writingcentre.uottawa.ca/hypergrammar/preposit.html)
10. [www.better-english.com/grammar/preposition.html](http://www.better-english.com/grammar/preposition.html)
11. <http://www.e-grammar.org/infinite-gerund/>
12. [www.idiomsite.com/](http://www.idiomsite.com/)

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## DEPARTMENT OF ELECTRONIC SCIENCES

HBMA17A02	<b>ALLIED MATHEMATICS II</b>	<b>3 1 0 4</b>
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(Common to all Under Graduate H&S courses)

### Course Outcomes:

To understand the Basic concepts in Ordinary Differential equations

To understand the Basic concepts in Partial Differentiation

To understand the Basic concepts in multiple integrals

To understand the Basic concepts in linear programming

To understand the Basic concepts in Transportation and Assignment

### **UNIT I            ORDINARY DIFFERENTIAL EQUATIONS            12**

First order differential equations – Second and higher order linear differential equations with constant coefficients and with RHS of the form:  $e^{ax}$ ,  $x^n$ ,  $\sin ax$ ,  $\cos ax$ ,  $e^{ax} f(x)$ ,  $x f(x)$  where  $f(x)$  is  $\sin bx$  or  $\cos bx$  (simple problems).

### **UNIT II            PARTIAL DIFFERENTIATION            12**

Partial derivatives – Jacobians – Maxima and Minima of functions of two variables – Lagrange's multipliers.

### **UNIT III            MULTIPLE INTEGRALS            12**

Double integral in Cartesian and Polar Co-ordinates – Change of order of integration – Triple integral in Cartesian Co-ordinates (simple problems).

### **UNIT IV            LINEAR PROGRAMMING            12**

Formulation of LPP – Standard form of LPP – Graphical method – Simplex method – Big M method.

### **UNIT V            TRANSPORTATION AND ASSIGNMENT            12**

Formulation of Transportation problem – North West corner method – Least cost method – Vogel's approximation method – Optimality test – MODI method – Degeneracy – Assignment problem: Hungarian method.

**Total no. of hrs:60**

### Reference Books:

- 1) Vittal.P.R, *Allied Mathematics*, Margham Publications., Chennai,(2012).
- 2) Venkatachalapathy.S.G, *Allied Mathematics*, Margham Publications., Chennai,(2007).
- 3) Singaravelu, *Allied Mathematics*, Meenakshi Agency., Chennai,(2001).
- 4) Hamdy A. Taha, *Operations Research: An Introduction (10<sup>th</sup> ed.)*, Pearson,(2017).
- 5) Hira D.S., Gupta P.K., *Operations Research*, S.Chand & Co.,(2014).



## DEPARTMENT OF ELECTRONIC SCIENCES

HBEC18003	ELECTRONIC CIRCUITS	3 1 0 4
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## UNITI      RECTIFIER &amp; POWERSUPPLY      12

Half & Full Wave Rectifies – Filters – Shunt, Inductor, LC Section & Ripple Factor,  $\pi$  Calculation for C, L and LC Filters – Voltage Regulators – Zener – Series Voltage Regulator – Shunt Voltage Regulator – SMPS- IC Voltage Regulators.

## UNIT II AMPLIFIERS 12

Amplifiers – Frequency Response of RC Coupled Amplifiers – Frequency Response of Emitter follower, Gain Band Width Product – FET - Amplifier at Low and High Frequency Cascaded Amplifiers

<b>UNIT III</b>	<b>FEED BACK AMPLIFIER &amp; OSCILLATORS</b>	<b>12</b>
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Four Basic Type of Feedback – Effect of Feedback on Amplifier Performance-Examples of Different types of Feedback Amplifiers-Voltage Series & Shunt Feedback, Current Series & Shunt Feedback – Condition for Oscillation Barkhausen Criteria – LC Oscillators – Hartley & Colpitts – RC Oscillators – Wein Bridge, RC Phase Shift Crystal Oscillator.

UNITIV MULTIVIBRATORS 12

Collector Coupled & Emitter Coupled Astable Multivibrator, – Mono Stable, Bistable Multivibrator – Triggering Methods – Storage Delay and Calculation of Switching Time - Schmitt Trigger Circuits, Speed up Capacitor in Switching.

UNIT V	POWER AMPLIFIER	12
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Classification – Class A, B, C & AB, Class B-push pull – Class B Complementary, Symmetry, Class S, Distortion in Amplifiers-TunedAmplifiers.

**Total No. of Hrs: 60**

**TEXT BOOKS:**

1. Mohammed. H. Rashid, "*Micro Electronic Circuits, Analysis and Design*", Thomson Learning
2. David.A.Bell, "*SolidstatePulseCircuits*", PrenticeHallIndia, 4thEdition, 2000.

### REFERENCE BOOKS:

1. Millman Taub ,"*H Pulse Digital & Switching waveform* ", Tata McGraw Hill International, 2001
2. Jacob Millman, Cristas C. Halkias," *Integrated Electronics*", Tata McGraw Hill., Edition 1991.



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18004</b>	<b>BASICS OF PCB DESIGN</b>	<b>3 1 0 4</b>
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### **UNIT-I INTRODUCTION TO BASICS OF ELECTRONIC COMPONENTS 12**

Study of electronic components: passive: - R, L, C –Types of R, L, C - Analysis of color code in R, C:  
 Active: –Diode, BJT, FET, MOSFET.

### **UNIT- II BASICS OF ELECTRONIC MEASUREMENTS 12**

Electronic Instruments: CRO: -Measurements of Voltage & Frequency, Function generator - Frequency  
 Measurements in various ranges and waveform: Power Supply: -Fixed and Variable Multi-meter Measurement  
 of Voltage, Current, Frequency, R, L, C: IC tester:-Linear ICs and Non Linear ICs: Solder practice.

### **UNIT III PCB DESIGN PROCESS 12**

Conception Level Introduction: Specifying Parts, Packages and Pin Names, Libraries and Checking foot prints  
 of the components, Part list, Net list, Making Net list Files, Placing Parts, Routing Traces, Modifying Traces,  
 Mounting Holes, Adding Text, PCB Layout, DRC, Pattern Transfer.

### **UNIT IV ASSEMBLING 12**

Identifying the components and its location on the PCB, soldering of active and passive components, testing  
 the assembled circuit for correct functionality.

### **UNIT V TESTING 12**

Soldering of simple electronic circuits - testing of circuits for correct functionality.

**Total Number of Hours: 60 Hrs**

#### **TEXT BOOKS:**

1. Orcad usermanual.
2. Raghbir Singh Khandpur, “*Printed Circuit Boards: Design, Fabrication, and Assembly*”, McGraw-Hill  
 Electronic Engineering-2006.



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## **DEPARTMENT OF ELECTRONIC SCIENCES**

<b>HBEC18L02</b>	<b>ELECTRONIC CIRCUITS LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS**

1. Load Characteristics of Zener VoltageRegulator.
2. Characteristics of Half-Wave Rectifier withFilter.
3. Characteristics of Full-Wave Rectifier withFilter.
4. Frequency Response of RC CoupledAmplifier.
5. Frequency Response of CEAmplifier.
6. RC Phase ShiftOscillator.
7. Wien BridgeOscillator.
8. HartleyOscillator.
9. Study ofMultivibrators.
10. Study of FeedbackAmplifiers.





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<b>HBCS17C03</b>	<b>OBJECT ORIENTED PROGRAMMING</b>	<b>3 1 0 4</b>
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### **UNIT:I PRINCIPLES OF OBJECT ORIENTED PROGRAMMING(OOP) 12**

Evolution of C++ -Programming Paradigms - Key Concepts of OOP - Advantages of OOP - Usage of OOP and C++ .Input and Output in C++-Streams-Stream classes Unformatted console I/O operations- Member functions of istream class-manipulators-manipulators with parameters

### **UNIT:II INTRODUCTION TO C++ 12**

Tokens, Keywords, Identifiers, Variables, Operators, Expressions and Control Structures: If, If.Else, Switch - Repetitive Statements- for, while, do...while - Pointers and arrays

### **UNIT:III FUNCTIONS IN C++ 12**

Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

### **UNIT:IV INHERITANCE 12**

Single Inheritance - Multilevel inheritance - Multiple inheritances - Hierarchical Inheritance - Hybrid Inheritance. Pointers - Virtual Functions and Polymorphism

### **UNIT:V WORKING WITH FILES 12**

Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - File Pointers - Updating a File - Error Handling during File Operations - Command-line Arguments

**Total Number of Periods: 60**

### **TEXT BOOKS:**

1. Ashok N. Kamthane, Object Oriented Programming with ANSI & Turbo C ++, Pearson Education, Aug 2009

### **REFERENCE BOOK:**

1. E. Balagurusamy, Object Oriented Programming with C++, Mc Graw Hill, 4<sup>th</sup> edition, 2008



## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18005</b>	<b>DIGITAL ELECTRONICS</b>	<b>3 1 0 4</b>
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<b>UNIT:</b>	<b>NUMBER SYSTEMS</b>	<b>12</b>
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Number systems - Conversion from one number system to another - compliments - Binary codes - Binary logic - Logic gates - Truth tables.

UNITII: **BOOLEAN ALGEBRA** 12

Boolean algebra – Sum of Products and Product of Sums – Truth table simplification of Boolean function - Karnaugh Map method – Introduction to Quine McClusky Method of Simplification.

<b>UNITIII:</b>	<b>COMBINATIONAL LOGIC</b>	<b>12</b>
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Adders - Subtractors - Decoders - Encoders - Multiplexer – De-multiplexer - Design of Circuits using decoders/Multiplexers - ROM - PLA

<b>UNITIV:</b>	<b>SEQUENTIAL LOGIC DESIGN</b>	<b>12</b>
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Sequential logic - RS, JK,D and T Flip flops - Registers -Shift Registers - Counters - Ripple Counters - Synchronous Counter - Design of Counters.

<b>UNIT-V: LOGIC FAMILIES</b>	<b>12</b>
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## Characteristics of RTL, DTL, TTL, MOS families - CMOS

**Total No of hours: 60**

**TEXT BOOKS:**

1. Charles H. Roth, "Fundamentals of Logic Design", Thompson Learning, 5th Edition.
2. John. M. Yarbrough, "Digital Logic: Application and Design", Thomson Learning

### REFERENCE BOOKS:

1. FLOYD:" Digital Fundamentals", 10th Edition Universal Book Stall, NewDelhi.1993.
2. Morris Mano, "Digital Electronics and Design", Prentice Hall of India,2000
3. ALBERT PAUL, MALVINO AND DONALD P LEACH: "Digital Principles and Applications" Tata McGraw Hillpublications.



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<b>HBEC18006</b>	<b>ANALOG COMMUNICATION</b>	<b>3 1 0 4</b>
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**UNITI: SIGNALS&NOISE 12**

Periodic & Aperiodic Signals – Noise - External Noise – Thermal Agitation – Shot Noise – Noise Figure – Signal to Noise Ratio – Equivalent Noise Resistance

**UNITII: INTRODUCTION TO COMMUNICATION 12**

Basic Communication Systems – Need for Modulation in Communication Systems – Amplitude Modulation – Double Side Band Amplitude Modulation – Single Side Band and VSB Modulation – Modulators, FM Modulation.

**UNITIII: DETECTORS, TRANSMITTER AND RECEIVER 12**

AM Demodulators – FM Detectors, AM Transmitter. FM Transmitter – SSB Transmitters, Broadband Transmitter and Receiver AM & FM Receivers, Communication Receivers.

**UNITIV: MODULATION TECHNIQUES AND PULSE MODULATION 12**

Phase Modulation – Noise Triangle – Pre-Emphasis and De-Emphasis – Stereophonic FM Multiplex System – Comparison of Wideband and Narrow Band FM – AFC, PAM, PDM.

**UNITV: DIGITAL MODULATION & INFORMATION THEORY 12**

Introduction - Information & Entropy, Source Coding Theory, Data Compaction, Discrete Memory less Channel, Mutual Information Channel Capacity, Channel Coding Theory.

**Total No. of Hrs:60**

**TEXTBOOKS:**

1. Roy Blake, "*Electronic Communication Systems*", Thomson Learning 2nd Edition, ,2002.
2. George Kennedy: "*Electronic Communication Systems*", Tata McGrawHill publications,1992

**REFERENCE BOOKS**

1. Taub&Schilling," *Principles of Communication*", Tata McGrawHill,1986
2. Simon Haykins, "*Principles of Communications*", Prentice Hall of India.2001



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<b>HBEC18007</b>	<b>LINEAR INTEGRATED CIRCUITS</b>	<b>3 1 0 4</b>
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<b>UNIT I: CIRCUIT CONFIGURATION FOR LINEAR ICs</b>	<b>12</b>
Current Sources, Analysis of Difference Amplifiers with Active Loads, Monolithic IC operational Amplifiers, Specifications, Frequency Compensation, Slew Rate and Methods of Improving Slew Rate.	
<b>UNIT II: APPLICATIONS</b>	<b>12</b>
Scale Changer- Inverter and Non-inverter - summer and Subtractor – Multiplier and Divider – Differentiator and Integrator – Instrumentation Amplifier – AC Amplifier – Op- Amp Circuits using Diodes; Precision Rectifier – Clipper and Clamper – Sample and Hold Circuit.	
<b>UNIT III: COMPARATORS AND SIGNAL GENERATORS</b>	<b>12</b>
Applications of Comparators – Regenerative Comparators (Schmitt Trigger) – Square Wave Generator (Astable Multivibrator) – Monostable Multivibrator – Triangular Wave Generator – Saw Tooth Wave Generator.	
<b>UNIT IV: ACTIVE FILTERS AND TIMERS</b>	<b>12</b>
RC Active Filters: Low pass – High pass – Band pass – Band reject – Notch – First order – Second order – Transformation – State Variable Filter – Timer Functional Diagram – Monostable operation – Astable operation – Application – Schmitt Trigger – Counter Timers.	
<b>UNIT V: PLL, ADC AND DAC</b>	<b>12</b>
Basic Principles – Phase Detector and Comparator: Analog and Digital Voltage Controlled Oscillator – Low pass Filter - PLL – Applications of PLL – DAC/ADC Techniques – Integrating DAC /ADC Specifications, High Speed A/D Converters (EX: Sigma-Delta ADC)	

**Total No. of Hrs: 60**

### TEXT BOOKS:

1. James. M. Fiore, "Operational amplifiers and linear integrated circuits", 1st Edition, Thomson Learning.
2. Roy Choudhury and Shail Jain: Linear Integrated Circuits, New Age International Publishers, 1991.

### REFERENCE BOOKS:

1. Coughlin and Dirscoll, "Operational Amplifiers and Linear Integrated Circuits", Prentice Hall of India Pvt., Ltd., 1992
2. Millman and Halkias: "Integrated Electronics", McGraw Hill, 1992.



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18008</b>	<b>INTRODUCTION TO IoT</b>	<b>3 1 0 4</b>
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### **UNIT- I INTRODUCTION TO INTERNET OF THINGS 12**

Definition and Characteristics of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – IoT enabling technologies – IoT Levels.

### **UNIT- II DOMAIN SPECIFIC IoT AND M2M 12**

Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health and Life style – Introduction to M2M – Difference between IoT to M2M – SDN and NFV for IoT.

### **UNIT -III IOT SYSTEM MANAGEMENT AND CLOUD 12**

Need for IoT System Management - SNMP – NETCONF – YANG – NETOPEER – IoT design methodology - Case study for IoT System – WAMP – AutoBahn for IoT – Xively – Django-Amazon Web for IoT – SkyNetIoT.

### **UNIT-IV IOT SYSTEMS – LOGICAL DESIGN USING PYTHON 12**

Introduction – Installing Python – python Data types and data structures – Control flow – Functions – Modules – Packages – File Handling – Data / Time Operations – Classes – Python packages of Interest for IoT.

### **UNIT-V IOT PHYSICAL DEVICES 12**

Raspberry Pi – Linux on Raspberry Pi - Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Arduino boards – Other IoT devices – Data analytics for IoT.

**Total Number of Hours: 60 Hrs**

#### **TEXTBOOKS:**

1. Arshdeep Bahga, Vijay Madisetti , “ *Internet of things – A hands- on approach* ” , Universities press, First Edition, 2015.
2. Adrian McEwen and Hakim Cassimally, “*Designing the Internet of Things*”, Wiley, First edition 2014.

#### **REFERENCE BOOK:**

1. C Hillar Gastn, “*Internet of Things with Python*”, Packt publishing, first edition, 2016.





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## **DEPARTMENT OF ELECTRONIC SCIENCES**

<b>HBEC18L03</b>	<b>DIGITAL ELECTRONICS LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS:**

1. Study of LogicGates.
2. Implementation of Booleanalgebra.
3. Verification of Half Adder and FullAdder.
4. Verification of Half Subtractor and FullSubtractor.
5. Encoder and Decoder.
6. Multiplexer and Demultiplexer.
7. Study of RS, D and TFlip-flops.
8. JohnsonCounter.
9. Shift Registers.
- 10.Study of CodeConvertors.



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**SYLLABUS (2017- 2018)**

HBMG14L01

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**CURRICULUM**  
**SOFT SKILL-I**

**Common to All UG Courses (H&S) (50+ 50)**

(i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networking), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. ( Physics), B.Sc. (Chemistry) etc)

**COURSE OBJECTIVES:**

1. to diagnose the strength and weakness of the student in Functional English
2. to develop the functional grammar
3. to prepare them to use Functional English through LSRW
4. to make them learn through practice and activity
5. to use English Language as a life skill

**Prelude**

Diagnostic Test- Articles, Forms of 'be' verbs, Tense, Preposition, Gerunds & Infinitives, Reported Speech, Active &Passive Voice, Letter Writing

**Unit I**

**6 hours**

Job and career- three types- Govt.,pvt and public sector-Bank, govt.offices, navy, defense, govt.institutions-IT and,BPo and corporate-semi govt like ISRO etc- requirements- advt- skills needed ( download the details)

Delivery

Audio and video cassettes

**Unit II**

**6 hours**

Technical skill- Communication skill especially in English- strengthening communicative English-Listening, Reading, speaking and writing- Listening- sounds of vowels and consonants and writing them-functional English -difference between functional and theoretical English

*R. Murthy*

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## DEPARTMENT OF ELECTRONIC SCIENCES

### Unit III

6 hours

Listening and writing

Activity based exercises on articles, modals, prepositions and infinitives

The above topics are chosen as we don't find equivalents' in LI

### Unit IV

6 hours

Reading and writing

Vocabulary-synonym, antonym, collocations, confused words, homonym, odd man out, words with correct spelling, avoid redundancy –Inferential comprehension ( based on BEC and Blog on Soft Skills BY me)-browsing , skimming and scanning note- making

### Unit V

6 hours

Speaking

Introducing yourself (giving questions)- collecting information in pairs and presenting it for 2 minutes – story telling through picture- interpretation of psychometric pictures through question and answer – PPT preparation and presentation-developing the story in pairs as game

**Total:**

**30 Periods**

**Text Book , Reference Books and Web Resources:**

1. Soft Skill for Everyone-Jeff Butterfield,Part-1; Unit-D&E
2. EFA (English For All)- Dr. Padmasanni Kannan, Libin Roy Thomas
3. English for Competitive Exam- R.P. Bhatnagar,Rajul Bhargava
4. Soft Skill Blog
5. Jobsearch.about.com
6. www.exsearch.in/interview.html

### COURSE LEARNING OUTCOME:

Students completing the course Soft Skill-I will be able to

1. know their weakness in the use of English Language.
2. understand the functionality of the language in simple context.
3. improve their communication skill through LSRW.
4. improve the functional grammar through practice and activity.
5. understand the necessity of English Language.

*R. K. K. K.*

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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBCS17C04</b>	<b>DATA STRUCTURES</b>	<b>3 1 0 4</b>
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<b>UNIT:I</b>	<b>DEFINITION OF A DATA STRUCTURE</b>	<b>12</b>
	Primitive and composite Data Types, Arrays, Operations on Arrays, Ordered lists.	
<b>UNIT:II</b>	<b>STACKS</b>	<b>12</b>
	Operations - Applications of Stack - Infix to Postfix Conversion, Recursion, Queue- operations.	
<b>UNIT:III</b>	<b>SINGLY LINKED LIST</b>	<b>12</b>
	Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List - Operations.	
<b>UNIT:IV</b>	<b>TREES AND GRAPHS</b>	<b>12</b>
	Binary Trees - Operations - Recursive Tree Traversals- Graph - Definition, Types of Graphs, Graph Traversal - DFS and BFS	
<b>UNIT:V</b>	<b>SEARCHING AND SORTING</b>	<b>12</b>
	Linear and binary search – <b>Sorting:</b> Insertion, Bubble, Quick and Merge sort.	

**Total Number of Periods : 60**

### TEXT BOOK:

1. C++ plus Data structure by N. Dale, publishers narosa publishing, Edition 2016.

### REFERENCE BOOKS:

1. Data Structures, A. Chitra, P.T. Rajan, Tata McGraw Hill Education 2007.
2. Fundamentals of Data Structures, Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Universities Press, 2008



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18009</b>	<b>MICROPROCESSOR AND MICROCONTROLLER</b>	<b>3 1 0 4</b>
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**UNITI: 8085 CPU 12**

8085 Architecture - Instruction set - Addressing modes – Timing diagrams –Assembly language- Programming –Counters –Time delays- Interrupts.

**UNITII: PERIPHERALS INTERFACING 12**

Interfacing serial I/O (8251)-Parallel I/O (8255) –Keyboard and display controller (8279)- ADC/DAC Interfacing-Timer (8253).Programmable Interrupt Controller (8259), DMA controller

**UNITIII: 8086 CPU 12**

Intel 8086 internal architecture –8086 Addressing modes –instruction set - Interrupts.

**UNITIV: 8051 MICROCONTROLLER 12**

8051 Microcontroller hardware –I/O pins, Ports and circuits-External memory –Counters and Timers-Serial Data I/O – Interrupts.

**UNITV: 8051 PROGRAMMINGAND APPLICATIONS 12**

8051 Instruction set – Addressing Modes –Assembly Language Programming -8051 interfacing LCD, ADC, and Sensors Stepper motors, Motors, Keyboard and DAC

**Total no of hours: 60**

### TEXT BOOKS:

1. Ramesh S Gaonkar, "Microprocessor Architecture, Programming and Application with8085", Penram International Publishing, New Delhi, 4th Edition 2000.(unit I,II)
2. John Uffenback, "The 80x86 Family, Design, Programming and Interfacing", Pearson education, 3rd Edition2002.
3. Mohammed ali Mazidi and Janice Gillispie Mazidi , "The 8051 Microcontroller andEmbedded Systems" ,Pearson education Asia ,New Delhi,2003.(Unit IV,V).

### REFERENCE BOOKS:

1. A. K. Ray and K. M. Burchandi, "Intel Microprocessors Architecture Programmingand Interfacing" McGraw Hill International edition,2000.
2. Kenneth J. Ayala, "The 8051 Microcontroller Architecture Programming and Application",2nd edition ,Penram International publishers (India), NewDelhi,1996.
3. M. Rafi Quazzaman, "Microprocessors Theory and Applications", Intel and MotorolaPrentice Hall of India Pvt. Ltd., New Delhi,2003.



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18010</b>	<b>DIGITAL COMMUNICATION</b>	<b>3 1 0 4</b>
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<b>UNITI: SAMPLING&amp;QUANTIZATION</b>	<b>12</b>
Sampling Theorem, Band pass sampling, Aliasing, Quantization - Uniform and Non Uniform Quantization, Quantization Error.	
<b>UNITII: PULSE MODULATION</b>	<b>12</b>
PCM and TDMA Principles, Differential Pulse Code Modulation and Delta Modulation, Linear Prediction and Prediction Filters, Speech Coding at Low Bit Rates.	
<b>UNITIII: BAND LIMITED SIGNALING</b>	<b>12</b>
Inter Symbol Interference, Ideal Nyquist Channel, and Raised Cosine Channels, Correlative Coding and Precoding, Eye Patterns and Equalization Techniques.	
<b>UNITIV: DIGITAL MODULATION, DETECTION AND ESTIMATION</b>	<b>12</b>
Gram Schmidt Procedures, Matched Filters, Correlation Receivers, Likelihood Functions, and Maximum Likelihood Detections, BPSK, QPSK, FSK and MSK Schemes Bit and Symbol Error Properties, Performance, Comparisons.	
<b>UNITV: ERROR CONTROL CODING</b>	<b>12</b>
Introduction to Linear Block Codes, Hamming Codes, BCH Coding, RS Coding, Convolution coding, Coding Gain Viterbi Decoding.	

**Total no of hours:60**

### TEXT BOOKS:

1. B.P. Lathi, "Modern Digital and Analog Communication System", Oxford publications, Third edition.
2. Simon Haykin, "Digital communications", John Wiley, 1988.

### REFERENCE BOOKS:

1. Roy Blake, "Electronic Communication Systems", Thomson Learning, 2nd edition 2002
2. John. G. Proakis, "Digital Communication", McGraw Hill Inc., Third Edition, Malaysia, 1995.
3. M.K. Simen, "Digital Communication Techniques Signal Design & Detection", Prentice Hall of India, 1999.





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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBSC18C08</b>	<b>COMPUTER NETWORKS</b>	<b>3 1 0 4</b>
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### **UNIT:I INTRODUCTION TO NETWORKS 12**

Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP models – Example networks: Internet, ATM, Ethernet and Wireless LANs - Physical layer – Theoretical basis for data communication - guided transmission media

### **UNIT:II MULTIPLEXING, SWITCHING 12**

Wireless transmission - Communication Satellites – Telephones structure – local loop, trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction.

### **UNIT:III DATA LINK LAYER 12**

Elementary data link protocols - sliding window protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols.

### **UNIT:IV NETWORK LAYER 12**

Network layer - design issues - Routing algorithms - Congestion control algorithms – IP protocol – IP Address – Internet Control Protocol.

### **UNIT:V TRANSPORT LAYER 12**

Transport layer - design issues - Connection management - Addressing, Establishing & releasing a connection – Simple Transport Protocol – Internet Transport Protocol - Network Security: Cryptography.

**Total Number of Periods: 60**

### **TEXT BOOK:**

1. A.S. Tanenbaum, Computer Networks, Fourth Edition, - Pearson Education, Inc, (Prentice hall of India Ltd), Delhi, Fifth Edition 2014

### **REFERENCE BOOKS:**

1. Data Communications and Networking By Behrouz A. Forouzan, Tata McGraw Hill, 4<sup>th</sup> Edition, 2006.
2. Computer Networks by M.Bhanumathi, Charulatha Publications, 2013.



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## DEPARTMENT OF ELECTRONIC SCIENCES

HBEC18L04	MICROPROCESSOR AND MICROCONTROLLER LAB	0 0 6 2
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### LIST OF EXPERIMENTS:

#### **8085 Programs:**

1. 8-bit Addition and Subtraction.
2. 16-bit Addition and Subtraction.
3. 8-bit Multiplication and Division.
4. Square of a number.
5. Square root of a number.
6. Ascending and Descending Order.

#### **8086 Programs:**

7. Addition and Subtraction.
8. Multiplication and Division

#### **Interfacing Programs:**

9. Stepper Motor Control.
10. Waveform Generation.
11. Traffic Light Control.
12. Matrix Display.



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## **DEPARTMENT OF ELECTRONIC SCIENCES**

<b>HBEC18L05</b>	<b>ANALOG COMMUNICATION LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS:**

1. Design of AmplitudeModulation.
2. Design of FrequencyModulation.
3. Design of AmplitudeDemodulation.
4. Design of FrequencyDemodulation.
5. Pre-emphasis andDe-emphasis.
6. Implementation of Pulse AmplitudeModulation.
7. Implementation of Pulse WidthModulation.
8. Diode DetectorCharacteristics.
9. Study of Phase LockedLoop.
10. Study of Cross-overnetwork.



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**QUALITATIVE AND QUANTITATIVE SKILLS**  
**SYLLABUS – 2017 – 2018**

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**CURRICULUM**  
**SOFT SKILL-II**

**Common to All UG Courses (H&S) (50+ 50)**  
 (i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networkihg), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. ( Physics), B.Sc. (Chemistry) etc)

**COURSE OBJECTIVES:**

1. to strengthen the students with the needed vocabulary
2. to infer information from the given passage through reasoning
3. to train them in attending Group Discussion
4. to face the Technical and HR interview of the corporate
5. to raise communication proficiency to global standards

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**Unit 1**

**6 hours**

Preparation of resume-functional resume with objective according to different advts.-how to have interview file—how to send it by email-concept of writing email-practise through BEC method(questions and answer )

**Unit 2**

**6 hours**

Writing secretarial letters like intra-mail and inter-mail, agenda, memo and business reports-introducing GD through video-conduct of GD on a topic and also case studies

**Unit 3**

**6 hours**

Body language-grooming –Interview skill- Dos and Donts- mock interview –exchange of interviewer and interviewee practical session

*R. Muthu*

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**Unit 4 ( Department of Mathematics)**  
**6 hours**

Number system – H.C.F & L.C.M – Problem on ages – Percentage – Profit & Loss – Ratio & Proportion – Partnership.

**Unit 5** **6 hours**

Time & Work – Time & Distance – Clocks – Permutations & Combinations – Heights & Distances – Odd man out and Series.

**Total:** **30 Periods**

### TEXT BOOKS, REFERENCE BOOKS AND WEB RESOURCES:

1. Soft Skill for Everyone-Jeff Butterfield,Part-1; Unit-D&E
2. EFA (English For All)- Dr. Padmasanni Kannan, Libin Roy Thomas
3. English for Competitive Exam- R.P. Bhatnagar,Rajul Bhargava
4. Placement Interview- S.Anandamurugan,Chapter-2&3
5. Alex K, Soft Skills ; S. Chand & Company Pvt Ltd, 2009
6. Rizvi Ashraf M, Effective Technical Communication ; Tata McGraw – Hill ; 2005
7. Thorpe, Edgar, Course in Mental Ability and Quantitative Aptitude : Tata McGraw – Hill, 2003
8. Agarwal, R.S, A Modern Approach to Verbal and Non-verbal Reasoning, S. Chand & Co ;2004
9. R.S.Agarwal, Quantitative Aptitude for Competitive Examinations, S.Chand & Co., (2017)
10. Jobsearch.about.com
11. [www.exsearch.in/interview.html](http://www.exsearch.in/interview.html)

### COURSE LEARNING OUTCOME:

Students completing the course Soft Skill-II will

1. be strengthened in the vocabulary
2. improve their reasoning and finding a logical sequence in the passage given
3. be prepared to face Group Discussion
4. know the nuances of the interview of the corporate
5. raise communication proficiency to global standards

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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18012</b>	<b>INTRODUCTION TO SIGNAL PROCESSING</b>	<b>3 1 0 4</b>
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### **UNIT- I: CLASSIFICATION OF SIGNALS AND SYSTEMS**

**12**

Continuous Time Signals (CT signals), Discrete Time Signals (DT Signals) – Step, Ramp, Pulse, Impulse, Exponential, Classification of CT and DT signals – Periodic and aperiodic, Random Signals, CT Systems and DT Systems, Classification of Systems – Linear Time Invariant Systems (LTI).

### **UNIT II: DFT AND CONVOLUTION**

**12**

Discrete Fourier Transform (DFT) - Properties - Inverse Discrete Fourier Transform (IDFT) - Convolution of Sequences - Linear Convolution—Circular Convolution.

### **UNIT III: FAST FOURIER TRANSFORM**

**12**

Introduction to Radix-2 FFT— Properties –DIT (FFT)- DIF (FFT)-Algorithms of Radix-2FFT-Computing Inverse DFT by doing a direct DFT - Review of Design Techniques for Analog Low Pass Filters- Frequency Transformation-Design of IIR Filters by Butterworth polynomial - Characteristics of FIR Filters with Linear Phase- Design of FIR Filters using Windows - Fourier Series Method.

### **UNIT IV: DESIGN OF DIGITAL FILTER**

**12**

Quantization Noise-Derivation for Quantization Noise Power-Fixed Point and Binary Floating Point Number Representations-Comparison-Overflow Error-Truncation Error-Co-efficient Quantization Error-Limit Cycle Oscillations- Signal Scaling-Analytical Model of Sample and Hold Operations.

### **UNIT-V: OVERVIEW OF DIGITAL SIGNAL PROCESSOR**

**12**

Architecture of TMS32C5X Processor – Addressing modes - Application of Digital Signal Processor – Memory Architecture of DSP Processor – Von Neumann Architecture – Harvard Architecture.

**Total No. of Hrs: 60**

### **TEXT BOOKS:**

1. Sanjit k. Mitra "*Digital signal processing*", A Computer Based Approach, Tata McGraw Hill, New delhi, 1998.
2. John.G.Proakis and Dimitris G.Manolakis, "*Digital Signal Processing Algorithm and Application*", PHI of India Ltd, New Delhi, 3<sup>rd</sup> edition 2000.

### **REFERENCE BOOK:**

1. Ashok Ambardar, "*Analog And Digital Signal Processing*", 2<sup>nd</sup> Edition, Thomson Learning 2000.



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18013</b>	<b>WAVE PROPAGATION AND ANTENNA THEORY</b>	<b>3 1 0 4</b>
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<b>UNIT I:</b>	<b>RADIATION PRINCIPLE AND ANTENNA TERMINOLOGIES</b>	<b>12</b>
Isotropic Radiator – Antenna Terminologies - Reciprocity Theorem - Friis Formula		
<b>UNIT II:</b>	<b>INTRODUCTION TO POINT SOURCES</b>	<b>12</b>
Point Sources – Arrays of Point Sources - Standing Wave Radiators.		
<b>UNIT III:</b>	<b>PATTERN MULTIPLICATION AND APPLICATIONS</b>	<b>12</b>
Pattern Multiplication - Broadside Arrays - End Fire Arrays - Collinear Arrays - Parasitic Arrays		
<b>UNIT IV:</b>	<b>GROUNDING EFFECT AND TYPES OF ANTENNAS</b>	<b>12</b>
Effects of Ground on Antenna Performance - Ground Systems - Top Loading - Excitation Methods - Yagi Antenna - Parabolic Reflectors		
<b>UNIT V:</b>	<b>WAVE PROPAGATION</b>	<b>12</b>
Propagation in Free Space - Propagation around the Earth - Surface Wave and its Propagation - Structure of the Ionosphere - Propagation of Plane Waves in an Ionized Medium - Determination of Critical Frequencies		

**Total no of hours: 60**

### TEXT BOOKS:

1. Prasad .K.D., "*Antennas and Wave Propagation*", Satya Prakasan, 3rd Edition, 1996
2. John D. Kraus, "*Antennas*" Tata McGraw Hill 2nd Edition, 2000..

### REFERENCE BOOKS:

1. Edward. C. Jordan and Keith.G. Balmain, "*Electromagnetic Waves and Radiating Systems*", Prentice Hall, 2nd Edition, 1995.
2. Ballany, "*Antenna Theory*", John Wiley & Sons, second edition, 2003.



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## ENVIRONMENTAL STUDIES

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### UNIT I ENVIRONMENT AND ECOSYSTEMS

Definition, scope and importance of environment – need for public awareness – concept, structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem. Biodiversity at National and local levels – India

### UNIT II ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Nuclear hazards (g) E-Wastes and causes, effects and control measures

### UNIT III NATURAL RESOURCES

Forest resources: Use and over-exploitation, deforestation. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems.

### UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns climate change, global warming, acid rain, ozone layer depletion, nuclear accidents ,central and state pollution control boards- Public awareness.

### UNIT V HUMAN POPULATION AND THE ENVIRONMENT:

Population growth, variation among nations – population explosion, environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health

TOTAL: 45 Hrs

PERIODS TEXT BOOKS: 1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004). .

Benny Joseph, 'Environmental Science and Engineering', Tata McGrawHill, NewDelhi, (2006).

Approved in  
Biotech BMS  
Rajeev Hc



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<b>HBEC18L06</b>	<b>DIGITAL COMMUNICATION LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS:**

1. STUDY OF SAMPLING THEOREM.
2. DESIGN OF PULSE CODE MODULATION.
3. IMPLEMENTATION OF PULSE POSITION MODULATION.
4. AMPLITUDE SHIFT KEYING.
5. FREQUENCY SHIFT KEYING.
6. PHASE SHIFT KEYING.
7. LINE CODING TECHNIQUES.
8. STUDY OF EYE PATTERN.
9. STUDY OF LISSAJOUS PATTERN.
10. STUDY OF PN SEQUENCE GENERATOR.



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<b>HBEC18L07</b>	<b>SIGNAL PROCESSING LAB</b>	<b>0 0 6 2</b>
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### **LIST OF EXPERIMENTS:**

1. GENERATION OF SIGNALS AND SEQUENCES.
2. LINEAR CONVOLUTION.
3. CIRCULAR CONVOLUTION.
4. DISCRETE FOURIER TRANSFORM.
5. LPF AND HPF.
6. BPF, BRF AND NOTCH FILTER.
7. INTERPOLATION AND DECIMATION.
8. PROGRAM FOR 2-D CORRELATION.
9. PROGRAM FOR 2-D F.T.
10. AMPLITUDE MODULATION.
11. FREQUENCY MODULATION.
12. ASK AND FSK.





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## DEPARTMENT OF ELECTRONIC SCIENCES

HBMG17G01

	ENTERPRENEURIAL DEVELOPMENT	L T P C
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### Unit – I Concept of Entrepreneurship

Entrepreneurship – Meaning – Types – Qualities of an Entrepreneur – Classification of Entrepreneur – Factors influencing Entrepreneurship – Functions of Entrepreneurships.

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### Unit – II Entrepreneurial Development Agencies

Commercial Banks – District Industries Centre – National Small Industries Corporation – Small Industries Development Organisation – Small Industries Service Institute, All India Financial Institutions – IDBI – IFCI – ICICI – IRDBI.

### Unit – III Project Management

Business idea generation techniques – Identification of Business Opportunities – Feasibility study – Marketing, Finance, Technology and Legal Formalities – Preparation of project report – Tools of Appraisal.

### Unit – IV Entrepreneurial Development Programmes

Entrepreneurial Development Programmes (EDP) – Role, relevance and achievements – Role of Government in organising EDPs – Critical Evaluation.

### Unit – V Economic Development and Entrepreneurial Growth

Role of Entrepreneurs in Economic Growth – Strategic approaches in the changing Economic scenario for small scale Entrepreneurs – Networking, Niche play, Geographic Concentration, Franchising / Dealership – Development of Women Entrepreneurship.

### Books:

1. Dr. V. Balu – ENTREPRENEURIAL DEVELOPMENT
2. Dr. P.T. Vijayashree & Dr. M. Alagammal – ENTREPRENEURIAL DEVELOPMENT

C.B. Sen  
5/6/17





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<b>HBEC18014</b>	<b>INTRODUCTION TO VLSI</b>	<b>3 1 0 4</b>
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<b>UNIT-I</b>	<b>MOS TRANSISTOR THEORY</b>	<b>12</b>
A brief History-MOS transistor, Ideal I-V characteristics, C-V characteristics, Non ideal I-V effects, DC transfer characteristics		
<b>UNIT- II</b>	<b>COMBINATIONAL CIRCUIT DESIGN</b>	<b>12</b>
Static CMOS – Bubble pushing, Compound gates, Asymmetric gates, Skewed gates, Ratioed circuits – Pseudo –nMOS, Dynamic circuits – Domino logic, Pass transistor logic – Comparison of circuit families.		
<b>UNIT- III</b>	<b>SEQUENTIAL CIRCUIT DESIGN</b>	<b>12</b>
Sequencing static circuits – Sequencing methods, Max – Delay and Min- Delay constraints, Conventional CMOS Latches and Flip flops – Pulsed latches – Differential flip flops – Traditional and Skew tolerant Domino circuits .		
<b>UNIT- IV</b>	<b>DATAPATH SUBSYSTEMS</b>	<b>12</b>
Single bit addition – Carry propagate addition – Magnitude comparator – Asynchronous and Synchronous counter – Coding - parity , Gray codes, Multiplication – Booth encoding and Wallace tree multiplication.		
<b>UNIT- V</b>	<b>BASIC SOFVERILOG</b>	<b>12</b>
Basic concepts- Operators- Basic constructs - Data flow and RTL, Structural gate level and switch level modeling, Behavioral and RTL modeling, Test Benches, Structural gate level description of decoder, equality detector, comparator, priority encoder, half adder, full adder, Ripple carry adder, D latch and D flip flop.		
		<b>Total no of hours: 60</b>

### TEXT BOOKS

1. Neil H.E. Weste ,David Harris and Ayan Benerjee: CMOS VLSI DESIGN (Third edition) Pearson Education
2. Uyemura J.P: Introduction to VLSI circuits and systems, Wiley

### REFERENCE BOOKS

1. D.A Pucknell & K.Eshraghian Basic VLSI Design, Third edition, PHI
2. Wayne Wolf, Modern VLSI design, Pearson Education



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## **DEPARTMENT OF ELECTRONIC SCIENCES**

<b>HBEC18L08</b>	<b>PROJECT</b>	<b>0 0 12 10</b>
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Individual or a group comprising of 4 or 5 students were expected to choose a research problem and execute it with proper data. They will explain their research project to a committee of faculty members.

## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18E01</b>	<b>NANOELECTRONICS</b>	<b>3 1 0 4</b>
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## UNIT-I EVOLUTION OF NANOELECTRONICS 12

Moore's Law – Silicon Electronics - Limitations - Discussion of the International Technology Roadmap characteristics: Need for new concepts in electronics – Silicon MOS Transistor from Micro to Nano – Future Opportunities - Nanocomputing

<b>UNIT-II</b>	<b>TUNNEL JUNCTIONS AND APPLICATIONS OF TUNNELING</b>	<b>12</b>
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Tunneling Through a Potential Barrier - Potential Energy Profiles for Material Interfaces – Metal -Insulator, Metal - Semiconductor, and Metal – Insulator - Metal Junctions - Applications of Tunneling - FieldEmission – Gate - Oxide Tunneling and Hot Electron Effects in MOSFETs - Double Barrier Tunneling and the Resonant TunnelingDiode

<b>UNIT-III</b>	<b>BALLISTIC AND SPIN TRANSPORT</b>	<b>12</b>
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Coulomb Blockade - Tunnel Junction Excited by a Current Source - Coulomb Blockade in a Quantum Dot  
Circuit – Single Electron Transistor - Ballistic Transport - Electron Collisions and Length Scales - Ballistic  
Transport Model - Quantum Resistance and Conductance - Transport of Spin and Spintronics Devices –  
Applications

<b>UNIT-IV</b>	<b>MOLECULARELECTRONICS</b>	<b>12</b>
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Introduction to molecular electronics - An atomistic view of electrical resistance - Schrodinger equation – Self-consistent field – Band structure - Level broadening - Coherent transport - Non-coherent transport in molecular electronics devices – Molecular Devices – Logic Switches – Interface Engineering - Issues

<b>UNIT- V</b>	<b>CHARACTERIZATION TECHNIQUES AND APPLICATION</b>	<b>12</b>
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Synthesis of nanomaterials - characterization techniques - SEM, FEM, STM, AFM, XRD - Modeling of Nanodevices - Applications.

**Total Number of Hours: 60**

**TEXT BOOKS:**

1. George W. Hanson, "Fundamentals of Nanoelectronics", Prentice Hall, 2007.
2. Karl Goser et.al, "Nanoelectronics and Nanosystems: From Transistors to Molecular and Quantum devices", Springer, 2005.
3. Mark. A. Reed and Takhee, "Molecular Electronics", American Scientific Publishers, 2003.

### REFERENCE BOOKS:

1. Mitin V., V. Kochelap, and M. Strosio, "Introduction to", Cambridge University Press, 2008.
2. Michael C. Petty, "Molecular Electronics: From Principles to Practice", John Wiley & Sons, Ltd, 2007.
3. Ramachandran K. I. et.al, "Computational Chemistry and Molecular Modeling", Springer, 2008.





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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18E03</b>	<b>INDUSTRIAL ELECTRONICS</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>
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### **UNIT-I DEVICES CHARACTERISTICS 12**

Industrial Electronic Devices Characteristics and applications of Thyatron, Ignitron, Thyristor, SCR and UJT - AC and DC switches - over voltage protection - flashers - static circuit breakers.

### **UNIT-II VOLTAGE REGULATORS 12**

Power Supplies: DC voltage regulators - different types of series voltage regulators - voltage and current regulation - controlled rectifiers and inverters - uninterruptible power supplies - Switched Mode Power Supply (SMPS).

### **UNIT-III MOTORS AND CONTROLS 12**

Motors and Controls: DC motors - automatic regulation of speed and overload reversing motors - AC motors - Induction motors - Speed control - Synchronous motors.

### **UNIT-IV WELDING AND HEATING 12**

Welding and Heating: Principle and Theory of induction heating - dielectric heating - resistance welding - Control Processes - Sequence timer - Synchronous Welding control - Temperature control circuits.

### **UNIT -V APPLICATIONS 12**

Applications in Industry: Relays and their characteristic and applications Generation, Detection and Application of Ultrasonic's, Application of LASER in industry.

**Total No. of Hours: 60**

### **TEXT BOOKS:**

1. Electronics and Industry - M.G. Chute and R. D. Chute, McGraw Hill
2. Industrial and Power Electronics- C. Rai, Umesh Publications, New Delhi.
3. Industrial Electronics - G.K. Mithal, Khanna Publishers, New Delhi, 2000.

### **REFERENCE BOOK:**

1. Industrial Electronics - Noel Morris, Tata McGraw Hill (II edition).



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18E04</b>	<b>MECHATRONICS</b>	<b>3 1 0 4</b>
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### **UNITI: OVERVIEW OF MECHATRONICS 12**

Mechatronic Design Approach, System Interfacing, Instrumentation and Control Systems. Microprocessor-Based Controllers and Microelectronics. An Introduction to Micro- and Nanotechnology Mechatronics: New Directions in Nano-, Micro-, and Mini-Scale Electromechanical Systems. Design, and Development

### **UNITII: PHYSICALSYSTEMMODELING 12**

Modeling Electromechanical Systems, Structures and Materials, Modeling of Mechanical Systems for Mechatronics Applications, Fluid Power System, Electrical Engineering, Engineering Thermodynamics, Modeling and Simulation for MEMS, Rotational and Translational Microelectromechanical Systems: MEMS Synthesis, Micro fabrication, Analysis, and Optimization.

### **UNITIII: SENSORSANDACTUATORS 12**

Introduction, Fundamentals of Time and Frequency, Sensor and Actuator Characteristics, Sensors, Linear and Rotational Sensors, Acceleration Sensors, Force Measurement, Torque and Power Measurement, Flow Measurement, Temperature Measurements, Distance Measuring and Proximity Sensors, Light Detection, Image, and Vision Systems, Integrated, Micro-sensors, Actuators, Electro-mechanical Actuators, Electrical Machines, Piezoelectric Actuators, Hydraulic and Pneumatic Actuation Systems, MEMS: Micro transducers Analysis.

### **UNITIV: SYSTEMSANDCONTROLS 12**

The Role of Controls in Mechatronics, The Role of Modeling in Mechatronics Design, Signals and Systems, Continuous and Discrete-time Signals, Transforms and Digital Systems, Continuous- and Discrete-time State-space Models, Transfer Functions and Laplace Transforms, State Space Analysis and System Properties, Response of Dynamic Systems, Root Locus Method, Frequency Response Methods, Kalman Filters as Dynamic System State Observers.

### **UNITV: COMPUTERS ANDLOGIC SYSTEMS: 12**

Introduction to Computers and Logic Systems, Logic Concepts and Design, System Interfaces, Communication and Computer Networks, Fault Analysis in Mechatronic Systems, Logic System Design, Synchronous and Asynchronous Sequential Systems, Architecture, Control with Embedded Computers and Programmable Logic Controllers. Software and Data Acquisition: Introduction to Data Acquisition, Measurement Techniques: Sensors and Transducers, A/D and D/A Conversion, Signal Conditioning.

**Total no of hours: 60**

### **TEXT BOOK:**

1. John G. Webster. Editor-in-chief. "Measurement, Instrumentation, and Sensors Handbook", CRC Press. 1999. 0-8493-2145-X. PDF files online available at [www.engnetbase.com](http://www.engnetbase.com)

### **REFERENCE BOOK:**

1. Mechatronics An introduction edited by Robert H. Bishop September 13, 2005 by CRC Press Reference - 312 Pages - 199 B/W Illustrations ISBN 9780849363580 - CAT#6358





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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18E05</b>	<b>INFORMATION CODING THEORY</b>	<b>3 1 0 4</b>
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### **UNIT-I INFORMATION THEORY 12**

Information – Entropy, Information rate, classification of codes, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

### **UNIT-II ERROR CONTROL CODING: BLOCK CODES 12**

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - CRC

### **UNIT-III ERROR CONTROL CODING: CONVOLUTIONAL CODES 12**

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding.

### **UNIT-IV SOURCE CODING: TEXT, AUDIO AND SPEECH 12**

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I, II, III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

### **UNIT-V SOURCE CODING: IMAGE AND VIDEO 12**

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I, B, P frames, Motion estimation, Motion compensation, H.261, MPEG standard

**Total no of Hrs: 60**

### **TEXT BOOKS:**

1. R Bose, “Information Theory, Coding and Cryptography”, TMH 2007
2. Fred Hallsall, “Multimedia Communications: Applications, Networks, Protocols and Standards”, Pearson Education Asia, 2002

### **REFERENCE BOOKS:**

1. K Sayood, “Introduction to Data Compression” 3/e, Elsevier 2006
2. S Gravano, “Introduction to Error Control Codes”, Oxford University Press 2007



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## DEPARTMENT OF ELECTRONIC SCIENCES

<b>HBEC18E06</b>	<b>CRYPTOGRAPHY</b>	<b>3 1 0 4</b>
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### **UNIT– I INTRODUCTION 12**

Computer Security concepts – OSI Security architecture – security attacks – security services- security mechanisms – classical encryption techniques, Classification of cryptography

### **UNIT– II BLOCK CIPHERS AND ENCRYPTION STANDARDS 12**

Block cipher – design principles – Data Encryption Standard (DES) – Strength of DES- Differential and Linear Cryptanalysis - Triple DES – AES

### **UNIT– III ASYMMETRIC CIPHERS 12**

Principle of public key cryptosystems – RSA Algorithm – Diffie – Hellman Key Exchange Elliptic curve arithmetic- Elliptic curve cryptography

### **UNIT– IV DATA INTEGRITY ALGORITHMS 12**

Simple hash functions-Requirements and security-Secure Hash algorithm(SHA)- Message authentication requirements, functions and codes- Digital Signatures

### **UNIT– V INTERNET SECURITY 12**

Pretty Good Privacy PGP – S/MIME- Domain Keys Identified Mail DKIM – IP Security overview- IP Security Policy – Encapsulating Security payload

**Total Number of Hours: 60**

#### **TEXT BOOK:**

1. William Stallings, “Cryptography and Network Security: Principles and practice”, Pearson Education Inc., 2016.

#### **REFERENCE BOOKS:**

1. Baxer, “Networking Security”, McGraw Hill, 1996.
2. Derek Atkins, “Internet Security”, Techmedia, 1998.



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<b>HBEC18E07</b>	<b>MEDICAL ELECTRONICS</b>	<b>3 1 0 4</b>
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**UNIT I      BIO-AMPLIFIERS      12**

Bio-Amplifiers: Bio potentials - bio - electricity, Necessity for special types of amplifiers for biological signal amplifications - different types of Bio-OP-AMPS.

**UNIT II      BIO-RECORDERS      12**

Bio-Potential Recording: ECG - EEG - EMG - ERG - Specific types of electrodes used - different lead systems - their waveforms.

**UNIT III      BIO-MEASUREMENTS      12**

Measurement of Biological Parameters Measurement of respiration rate - measurement of heart beat rate - measurement of temperature - measurement of blood pressure - patient monitoring set up - blood flow meters EM and plethysmographic technique.

**UNIT IV      APPLICATIONS      12**

High Energy Radiation Applications: Applications of X-ray and isotopes for diagnostics and therapeutic applications - application of Lasers in biological medium.

**UNIT V      HIGH FREQUENCY APPLICATIONS      12**

High Frequency Applications: Diathermy effect - Short wave diathermy - Ultrasonic diathermy - Microwave diathermy.

**Total Number of Hours: 60**

### TEXT BOOKS:

1. Clinical Engineering - Jacobster and Webster, PHI.
2. Applied Biomedical Instrumentation - Geddes and Baker, John Wiley & Sons.
3. Biomedical Instrumentation - M. Arumugham, Anuradha Agencies Publishers (II Edition)



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<b>HBEC18E08</b>	<b>ROBOTICS</b>	<b>3 1 0 4</b>
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<b>UNITI:</b>	<b>INTRODUCTION</b>	<b>12</b>
	Robot anatomy-Definition, law of robotics, History and Terminology of Robotics-Accuracy and repeatability of Robotics-Simple problems - Specifications of Robot-Speed of Robot.	
<b>UNITII:</b>	<b>END EFFECTORS ANDROBOT CONTROLS</b>	<b>12</b>
	Mechanical grippers-Slider crank mechanism, Screw type, Rotary actuators, cam type-Magnetic grippers-Vacuum grippers-Air operated grippers-Gripper force analysis-Gripper design	
<b>UNITIII:</b>	<b>ROBOT TRANSFORMATIONS ANDSENSORS</b>	<b>12</b>
	Robot kinematics-Types- 2D, 3D Transformation-Scaling, Rotation and Translation- Homogeneous coordinates multiple transformation-Simple problems. Sensors in robot	
<b>UNITIV:</b>	<b>ROBOT CELL DESIGN ANDAPPLICATIONS</b>	<b>12</b>
	Robot work cell design and control-Sequence control, Operator interface, Safety monitoring devices in Robot-Mobile robot working principle.	
<b>UNITV:</b>	<b>MICRO / NANOROBOTICS SYSTEM</b>	<b>12</b>
	Micro/Nano robotics system overview-Scaling effect-Top down and bottom- up approach- Actuators of Micro/Nano robotics system-Nanorobot communication techniques	

**Total Number of Hours: 60**

### TEXT BOOKS:

1. S.R. Deb, Robotics Technology and flexible automation, Tata McGraw-Hill Education.,2009.
2. Mikell P Groover & Nicholas G Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta,Industrial Robotics, Technology programming and Applications, McGraw Hill,2012.
3. Richard D. Klafter, Thomas .A, Chri Elewski, Michael Negin, Robotics Engineering anIntegrated Approach, Phi Learning.,2009.

### REFERENCE BOOKS:

1. Francis N. Nagy, Andras Siegler, Engineering foundation of Robotics, Prentice Hall Inc.,1987.
2. P.A. Janaki Raman, Robotics and Image Processing an Introduction, Tata McGrawHill Publishing company Ltd.,1995.
3. Bharat Bhushan., “*Springer Handbook of Nanotechnology*”, Springer,2004.