NANDHA ENGINEERING COLLEGE

(AUTONOMOUS)
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
ERODE – 638 052 TAMILNADU
Email : principal@nandhaengg.org Mobile : 73737 12234

Criterion 3 – Research, Innovations and Extension	
3.4	Research Publications and Awards

3.4.1. *The Institution ensures implementation of its stated Code of Ethics for research through the following:*

1. Inclusion of research ethics in the research methodology course work
2. Presence of Ethics committee
3. Plagiarism check through software
4. Research Advisory Committee

1. INCLUSION OF RESEARCH ETHICS IN RESEARCH METHODOLOGY COURSE WORK

RESEARCH METHODOLOGY (COURSE WORK)

NANDHA ENGINEERING COLLEGE, ERODE – 638 052

(An Autonomous Institution, Affiliated to Anna University Chennai and
Approved by AICTE New Delhi)

MINUTES OF THE 8th BOARD OF STUDIES MEETING

Name of the Body	Board of Studies
Name of the Board	Electronics and Communication Engineering
Meeting No.	08
Date & Time	04.09.2020, 3.00 pm
Venue	Online mode – Google meet

PRINCIPAL
Nandha Engineering College
(Autonomous)
Erode - 638 052.

1

NANDHA ENGINEERING COLLEGE, ERODE – 638 052

(An Autonomous Institution, Affiliated to Anna University Chennai and Approved by AICTE New Delhi)

Minutes of 8th Board of Studies Meeting (BoS) held on 04.09.2020

The 8th Board of Studies (BoS) meeting was held on 04.09.2020 by 3.00 pm through online mode, Nandha Engineering College, Erode - 52. The members attended the meeting are given in **Annexure I.**

The Chairman of the BoS, Dr.C.N.Marimuthu, Professor & Dean, Electronics and Communication Engineering welcomed the members for the meeting. Then, the items listed below were taken for discussion.

BoS-8 Board: Electronics and Communication Engineering	Date:04.09.2020 Mode of meeting: Online
AGENDA	
• **Welcome**	
• **Introduction of External & Internal Members**	

Item 8.01	Review of Action Taken Report on 7th BoS meeting.
Item 8.02	Review of Action Taken Report on 7th Academic Council (points related to ECE program).
Item 8.03	Minutes of 20th Standing Committee for Academic Affairs (Decision taken for introducing following courses) - for information. a) New Courses • 17CSX31- Problem Solving and Programming (CSE Board) • 17EYX01 - Effective Communication (S&H Board) • 17ITX26 - Problem Solving and Algorithmic Skills (IT Board) • 17EYZ04 - Employability Enhancement and Analytical Skills (S&H Board) b) Allowing students to earn max. 15 credits through online courses. c) Review of CAT pattern: two CAT + one Re-CAT d) Provision for winter track courses. e) Provision of minimum 16 and maximum 30 credits for course registration per semester and 12 credits in the final semester
Item 8.04	Consideration of credits earned through online/ one credit courses or combination of both.
Item 8.05	Approval and Revision of Program Specific Elective courses in R17 regulation for UG program • 17ECX16 - Internet of Things and its Applications • 17ECX19 - Network Security And Cryptography
Item 8.06	Approval of one credit courses conducted for 2nd and 3rd year B.E – ECE students in the Academic Year 2018 – 19 (Even Semester) and 2019-20 (Odd and Even Semesters).
Item 8.07	Revision of number of PSE and OE

PRINCIPAL
Nandha Engineering College
(Autonomous)
Erode - 638 052.

PG	
Item 8.08	Introduction of Open Electives (R17) for PG program M.E.-VLSI Design during 2nd & 3rd semester. • Research Methodology (MBA board)
Item 8.09	Any other matter
	Vote of Thanks

The proceedings of BoS started and the minutes of the meeting are recorded as follows:

Item - 8.01	Review of Action Taken Report on 7th BoS meeting
Resolution	Reviewed and approved the Action taken Report of 7th BoS meeting.
Item - 8.02	Review of Action Taken Report on 7th Academic Council (points related to ECE program).
Resolution	Reviewed and approved the Action taken Report of 7th Academic Council.

Item 8.03	Minutes of 20th Standing Committee for Academic Affairs (Decision taken for introducing following courses) - for information.
	 a) New Courses
	   • 17CSX31- Problem Solving and Programming (CSE Board)
	   • 17EYX01 - Effective Communication (S&H Board)
	   • 17ITX26 - Problem Solving and Algorithmic Skills (IT Board)
	   • 17EYZ04 - Employability Enhancement and Analytical Skills (S&H Board)
	 b) Allowing students to earn max. 15 credits through online courses.
	 c) Review of CAT pattern: two CAT + one Re-CAT
	 d) Provision of minimum 16 and maximum 30 credits for course registration per semester and 12 credits in the final semester

Discussion	Dr.R.Sakthivel asked to verify and confirm that the syllabus of Problem Solving and Programming and Problem Solving and Algorithmic Skills do not overlap.
Item 8.04	Consideration of credits earned through online/ one credit courses or combination of both.
Discussion	Accepted by all the BOS members.

Item 8.05	Approval and Revision of Program Specific Elective courses in R17 regulation for UG program
	   • 17ECX16 - Internet of Things and its Applications
	   • 17ECX19 - Network Security And Cryptography

Discussion	**17ECX16 - Internet of Things and its Applications**
	   ➢ The Prepared syllabus is good and updated.
	 17ECX19 - Network Security And Cryptography
	   ➢ Dr.B.Somasundaram suggested to include latest and standard topics such as IEC 62443, ISO 27001, Art cyber security, Data diode, Defense in depth philosophy for both transmission and reception.
	
	   ➢ Dr.G.Uma Maheswari advised to change the topic as Cryptography and network Security, remove RC in Unit-2 and to replace recent edition instead of older edition in the text books.

3

Resolution	Resolved to Approve and Revise Program Specific Elective courses in R17 regulation for UG program • 17ECX16 - Internet of Things and its Applications • 17ECX19 - Network Security and Cryptography.
Item 8.06	Approval of one credit courses conducted for 2nd and 3rd year B.E – ECE students in the Academic Year 2018 – 19 (Even Semester) and 2019-20 (Odd and Even Semesters).
Discussion	**2018-19 Even sem** 17ECI02- Industrial Automation Using PLC 15ECI08 - Industrial Automation Using PLC **2019-20 Odd Sem** 17ECI04- PC Hardware Assembling And Trouble Shooting 17ECI03- Embedded System Using Arduino 17ITC05- SPRINGBOOT 17ECI05- ROBOTICS
Resolution	Resolved to approve the titles of one credit courses conducted for 3rd Semester to 8th Semester B.E - Electronics and Communication Engineering students in the Academic Year (2018-19 & 2020 – 21).
Item 8.07	Revision of number of PSE and OE.
	• 2 PSE converted to PSE/OE • 1 PC and 1 PSE exchanged in sixth and seventh semesters • 1 PSE removed in Eighth semester Changes done to implement R17 regulation and credits are reduced to 168 from 172.
Resolution	Resolved to approve the changes.
Item 8.08	Introduction of Open Electives (R17) for PG program M.E.-VLSI Design during 2nd & 3rd semester. • Research Methodology (MBA board)
Discussion	**Research Methodology (MBA board)** ➤ Dr.B.Somasundaram sir informed to add the topics such as double diamond approach, Dr.Prakalathan's co-creation methodology to make products from projects. ➤ Dr.R.Sakthivel suggested to include topics with some drawing and drafting tools under report writing.
Item 8.09	Any other matter
Resolution	Decided to get feedback from current year passed out students and alumni.

The Chairman thanked all the members for their active participation.

Date: 04.09.2020.

CN.ma

Dr.C.N.Marimuthu
(Chairman, BoS / Prof. & Dean /ECE)

Principal

4

PRINCIPAL
Nandha Engineering College
(Autonomous)
Erode - 638 052.

17BAZ01- RESEARCH METHODOLOGY				
	L	T	P	C
	3	0	0	3

PREREQUISITE: NIL

COURSE OBJECTIVES AND OUTCOMES:

	Course Objectives		Course Outcomes	Program outcomes
1.0	To understand the basic concepts of research and its methodologies, sources of information for literature review	1.1	Demonstrate the concepts of research and its methodologies, sources of information for literature review	a,c,d,e,f,g,h,j,k,l
2.0	To identify the various procedures to formulate appropriate research design, data collection and measurement.	2.1	Formulate appropriate research design, data collection and conduct the experiments using systematic methods.	a,b,c,e,f,g,h,i,k,l
3.0	To summarize various methods for data preparation and analysis	3.1	Identify the design for coding, editing and analysis of data	b,c,d,e,f,g,h,i,j,k
4.0	To provide knowledge of report types, report writing and guidelines to review report	4.1	Choose the process like drawing and drafting tools and reviewing research papers	c,d,e,f,g,h,i,j,k,l
5.0	To summarize the Intellectual property rights and Ethics in research	5.1	Formulate the design for Intellectual property rights and code of ethics	b,c,d,e,f,h,i,j,k,l

UNIT I : INTRODUCTION (7)

Research methodology - Understanding the language of research – Concepts, constructs, operational definitions, variables, propositions, hypotheses, theories, and models - Research process- Literature review -Types of research.

UNIT II : RESEARCH DESIGN, DATA COLLECTION AND MEASUREMENT (10)

Problem identification and formulation - Research question – Research hypothesis - Measurement issues - Methods of data collection Types of data- Primary data- Scales of measurement- Sources and collection of data Observation method- Interview method– Survey- Experiments- Secondary data-Research design- Qualitative and Quantitative Research.

UNIT III : DATA PREPARATION AND ANALYSIS (10)

Processing and analysis of data- Sampling- Steps and characteristics of sampling design Sampling: concepts of Population, Sample, Sampling Frame, - Sample size and its determination - Types of sampling distributions - Sampling error - Statistics in research Descriptive statistics and inferential statistics- Measures of central tendency, dispersion, skewness, asymmetry- Measures of relationship- Correlation and regression- Simple regression analysis- Multiple regression -Hypothesis Testing - parametric and non-parametric tests- Analysis of single factor experiments.

UNIT IV : REPORT WRITING AND DESIGN (10)

Reporting and presenting research - Written and oral communications -Hallmark of great scientific writing-The reading toolkit - Pre-writing considerations - Format of dissertations-Drawing and Drafting Tools, research reports, and research papers – Paper title and keywords – Writing an abstract – Writing the different sections of a paper - Revising a paper - Responding to peer reviews - Reviewing research papers - Plagiarism - Conference and poster presentations - Language aspects of report writing -Verb, tense and voice in scientific writing - Errors in grammar - Sentence and paragraph constructions -Paraphrasing - Measures of research impact.

UNIT V : INTELLECTUAL PROPERTY RIGHTS AND ETHICS IN RESEARCH **(8)**

Intellectual property rights-Co-creation Methodology to make products from projects - Copyright - Patents - The codes of ethics - Avoiding the problems of biased survey -Occupational health and safety.

TOTAL : L: 45 = 45 PERIODS

REFERENCES:
1. Cooper, D. R. and Schindler, P. S., (2009), *Business Research Methods*, Tata McGraw Hill, 9th Edition.
2. Jackson, S.L., *Research Methods and Statistics*, Cengage Learning India Private Limited, New Delhi, 2009
3. Krishnaswamy, K.N., Sivakumar, A.I., and Mathirajan, M., *Management Research Methodology*, Pearson Education , 2006.
4. Lebrun, J-L., *Scientific Writing: A Reader and Writer's Guide*, World Scientific Publishing Co. Pte. Ltd., Singapore, 2007.
5. MLA, MLA *Handbook for Writers of Research papers*, Seventh Edition, Affiliated East West Press Pvt Ltd, New Delhi, 2009.
6. Thiel, D. V., *Research Methods for Engineers*, Cambridge University Press, 2014.

PRINCIPAL
Nandha Engineering College
(Autonomous)
Erode - 638 052.