



Samarinda, Indonesia October 23-24, 2021

The 4th

International Conference on Applied Science and
Technology on Engineering Science 2021
(iCAST-ES 2021)

Developing innovation and
green technology to
sustain the economic and
social life in new normal.

Virtual Conference

Due to covid-19 outbreak,
all activities related to
this conference are going to be
conducted virtually



Keynote Speakers

Prof. Dr. Arshad Ahmad

School of Chemical and
Energy Engineering,
Universiti Teknologi Malaysia

Prof. Peter Sheehan

Victoria University
MELBOURNE, AUSTRALIA

Speakers

Teten Hadi Rustendi

Director & COO
PT Badak LGN

Muhammad Yamin

Presiden Director
Bank Kaltimara

Website : <https://icast.isas.or.id/2021/>

Contact Person : Ratna Wulaningrum (icast2021@polnes.ac.id)

Organized by Indonesian Polytechnics Consortium

The 4th International Conference on Applied Science and Technology (iCAST 2021)

October 23rd 2021
Samarinda, Indonesia

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Committee iCAST-ES/SS

1. Committee of International Conference on Applied Science and Technology on Social Science (ICAST-SS) 2021

Host Organizer

Politeknik Negeri Samarinda (POLNES)

General Chairman

Amiril Azizah, S.E., M.Si., Ph.D (Politeknik Negeri Samarinda)

Steering Committee

1. Dr. Zainal Arief, ST, MT (Forum Direktur Politeknik Negeri Se-Indonesia (FDPNI); (Politeknik Elektronika Negeri Surabaya, Indonesia))
2. Prof. Dr. Adrianus Amheka, S.T., M.Eng (Indonesian Society of Applied Science (ISAS); Politeknik Negeri Kupang, Indonesia)
3. Budi Nugroho, ST., M.Eng (Politeknik Negeri Samarinda)
4. Ahyar Muhammad Diah, SE., MM., Ph.D (Politeknik Negeri Samarinda)

Program Chairs

1. Dwi Cahyadi, ST., MT (Politeknik Negeri Samarinda)

Publicity Chair

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2. Aliv Faizal M., S.Pd., M.Pd. (Politeknik Elektronika Negeri Surabaya, Indonesia)

Publication Chair

1. Ratna Wulaningrum, SE., M.Si (Politeknik Negeri Samarinda)

Local Committee

- Organizing Chair: Muh. Irwan, ST., M.Eng., Ph.D (Politeknik Negeri Samarinda)
- Secretariat: Faisyal, ST., MT (Politeknik Negeri Samarinda)
- Network and Technical Support: Achmad Rodzali, S.Si., M.Si (Politeknik Negeri Samarinda)

Treasurer

- Dwi Haryanti, S.Ak., M.Ak (Politeknik Negeri Ambon)
- Dita Andansari, S.T., M.Ds (Politeknik Negeri Samarinda)

Technical Program Committee

- Dr. Benny Benyamin Nasution (Politeknik Negeri Medan, Indonesia)
- Dr. Bima Sena Bayu Dewantara (Politeknik Elektronika Negeri Surabaya, Indonesia)
- Buyung Kosasih, Ph.D (University of Wollongong, Australia)
- Dr. Daniel Sutopo Pamungkas (Politeknik Negeri Batam, Surabaya)
- Dr. Elena Rusu Cigu (Alexandru Ioan Cuza University of Iasi, Romania)
- Prof. Herve Boileau (Savoy University, France)
- Dr. Hoa Nguyen (Osaka University, Japan)
- Huai-Kuei Wu, Ph.D (Oriental Institute of Technology, Taiwan)
- Dr. Lilik Sudiajeng (Politeknik Negeri Bali, Indonesia)
- Dr. Jonatan Lassa (Charles Darwin University, Australia)

- Dr. Kathleen Aviso (De La Salle University, Philippines)
- Dr. Krista Danielle Yu (De La Salle University, Philippines)
- Dr. Philipp Thies (University of Exeter, United Kingdom)
- Dr. Rita Martini (Politeknik Negeri Sriwijaya, Indonesia)
- Prof. Soushi Suzuki (Hokkai-Gakuen University, Japan)
- Prof. Takeshi Mizunoya (University of Tsukuba, Japan)
- Dr. Tineke Saroinsong (Politeknik Negeri Manado, Indonesia)
- Dr. Qian Zhou (North China Electric Power University, China)
- Mr. Vincent Dacanay (De La Salle University, Philippines)
- Prof. Wahidul Biswas (Curtin University, Australia)
- Dr. Yuhefizar (Politeknik Negeri Padang, Indonesia)

2. Committee of International Conference on Applied Science and Technology on Engineering Science (ICAST-ES) 2021

Host Organizer

Politeknik Negeri Samarinda (POLNES)

General Chairman

Amiril Azizah, S.E., M.Si., Ph.D (Politeknik Negeri Samarinda)

Steering Committee

1. Dr. Zainal Arief, ST, MT (Forum Direktur Politeknik Negeri Se-Indonesia (FDPND); (Politeknik Elektronika Negeri Surabaya, Indonesia))
2. Prof. Dr. Adrianus Amheka, S.T., M.Eng (Indonesian Society of Applied Science (ISAS); Politeknik Negeri Kupang, Indonesia)
3. Ramli, S.T., M.Eng.(Politeknik Negeri Samarinda)
4. Dedy Irawan, ST., MT (Politeknik Negeri Samarinda)
5. Dr. Dewi Yanti Liliana, S.Kom, M. Kom (Politeknik Negeri Jakarta, Indonesia)
6. M. Udin Harun Al Rasyid, S.Kom, Ph.D (Politeknik Elektronika Negeri Surabaya, Indonesia)

Program Chairs

1. Daniel Sutopo Pamungkas, Ph.D., IPM (Politeknik Negeri Batam, Indonesia)
2. Tien Rahayu Tulili, ST., M.Tech (Politeknik Negeri Samarinda)

Publicity Chair

1. Karyo Budi Utomo, S.Kom., M.Eng (Politeknik Negeri Samarinda)
2. Aliv Faizal M., S.Pd., M.Pd. (Politeknik Elektronika Negeri Surabaya, Indonesia)

Publication Chair

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2. Dr. Eng. Hidayat, ST., MT (Politeknik Negeri Samarinda)
3. Dedi Kurniadi, S.ST.,M.Sc (Politeknik Negeri Padang, Indonesia)

Local Committee

- Organizing Chair : Zainal Arifin, ST., M.Eng (Politeknik Negeri Samarinda)
- Secretariat : Faisyal, ST., MT (Politeknik Negeri Samarinda)

- Network and Technical Support : Achmad Rodzali, S.Si., M.Si (Politeknik Negeri Samarinda)

Treasurer

1. Ida Nurhayati, S.H.,M.H. (Politeknik Negeri Jakarta, Indonesia)
2. Dita Andansari, S.T., M.Ds (Politeknik Negeri Samarinda)

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- Dr. Benny Benyamin Nasution (Politeknik Negeri Medan, Indonesia)
- Dr. Bima Sena Bayu Dewantara (Politeknik Elektronika Negeri Surabaya, Indonesia)
- Buyung Kosasih, Ph.D (University of Wollongong, Australia)
- Dr. Daniel Sutopo Pamungkas (Politeknik Negeri Batam, Surabaya)
- Dr. Elena Rusu Cigu (Alexandru Ioan Cuza University of Iasi, Romania)
- Prof. Herve Boileau (Savoy University, France)
- Dr. Hoa Nguyen (Osaka University, Japan)
- Huai-Kuei Wu, Ph.D (Oriental Institute of Technology, Taiwan)
- Dr. Lilik Sudiajeng (Politeknik Negeri Bali, Indonesia)
- Dr. Jonatan Lassa (Charles Darwin University, Australia)
- Dr. Kathleen Aviso (De La Salle University, Philippines)
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- Dr. Philipp Thies (University of Exeter, United Kingdom)
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- Prof. Takeshi Mizunoya (University of Tsukuba, Japan)
- Dr. Tineke Saroinsong (Politeknik Negeri Manado, Indonesia)
- Dr. Qian Zhou (North China Electric Power University, China)
- Mr. Vincent Dacanay (De La Salle University, Philippines)
- Prof. Wahidul Biswas (Curtin University, Australia)
- Dr. Yuhefizar (Politeknik Negeri Padang, Indonesia)

Welcome Message from Director of State Polytechnic of Samarinda

Assalamualaikum Warahmatullahi Wabarakatuh

It is my great pleasure and honor as Director of Polytechnic State of Samarinda (POLNES) to welcome all of you to the International Conference on Applied Science and Technology (iCAST) 2021, which is held at Samarinda, Indonesia on October 23-24, 2021. Moreover, I would like to welcome all the keynote speakers and discussion panelists. I am sure you will find this conference developing innovation and green technology to sustain the economic and social life in the new normal era.



This International conference first held in 2018 in Polytechnics State of Manado and the second 2019 in Polytechnics State of Bali. Because of the covid 19 in 2020 the conference held on Polytechnic state of Padang by online. This year is the 2th virtual conference in Polytechnics State of Samarinda. This conference iCAST 2021 contains two tracks: International conference of applied science on Technology Engineering Science (iCAST ES) and International applied science on Technology Social Science (iCAST SS). The Participants includes lecturers of polytechnics from all over Indonesia, lecturers from Universities in Indonesia and other countries which are: UTM Malaysia, National Chin Yi University of technology, Taiwan.

This conference would have not been possible without the contributions and hard work of the keynote and invited speakers, all the authors and reviewers, the advisory committee as well as chair persons, Technical Committee and Organizing Committee. Allow me to take this opportunity to express my sincere appreciation to all of you.

I do expect this conference will give essential contributions to the development on the aspects of researches, academics, and industries nationally and globally. I hope that all participants have fruitful and technical discussions and enjoy the conference.

See you on next iCAST 2022.

Wassalamualaikum Warahmatullahi Wabarakatuh.

Samarinda, October 23, 2021

Ir. Ramli, S.T., M.Eng.
Director of Polytechnics State of Samarinda

Welcome Message from Chairman of ISAS

First of all, we would like to extend our gratitude to God Almighty, for the help and intervention so that The 4th International Conference on Applied Science and Technology 2021 at the State Polytechnic of Samarinda can be held properly.

iCAST 2021 is one of a series of international scientific meeting activities that are packaged in the form of an annual international scientific conference where ISAS is the organizer in coordination with FDPNI through the Heads of Staff, UP2M/P3M and ISAS administrators, where ISAS is a professional association whose membership currently consists of fellow academics from 44 State Polytechnics throughout Indonesia.



iCAST 2021 has a theme: Developing innovation and green technology to sustain the economic and social life in the new normal. The theme is visualization through two scientific tracks, namely Engineering and Commerce.

For Engineering, the sub-theme is: Developing innovation and green technology to sustain the economic in new normal during the Covid-19 Pandemic, while for Social Science the sub-theme is: Creativity of small business to Sustain Economic in new normal during the Covid-19 Pandemic.

The hope, through iCAST 2021, is, for the first time, to provide promotions for virtually massive scientific events in the form of disseminating international-scale research results and international-standard national research results in which the outputs will be published in reputable International Proceedings. However, by respecting the scale of applied research and development as an important indicator of academic vocational people, it is also expected to be able to capture innovation products that are invented in the form of promotion-oriented Paper articles to the global community as opportunities for down streaming of applied research and development innovation products. provides ample scope for basic and similar research in both the fields of Engineering and Commerce globally. The second hope, through iCAST 2021, is to provide multiplication of promotions on a virtually ideal platform for discussion, identification and consultation to lead to an international standard scientific collaboration that is well-established and qualified in support of global scientific principles.

Thus the welcome remark for iCAST 2021, and with gratitude on behalf of the ISAS management colleagues, we express our deepest gratitude to all parties who have contributed starting from the preparation stage, until today's conference activities went well.

Greetings and health always.

Wassalamualaikum warahmatullahi wabarakatuh.

Kupang, October 23, 2021

Prof. Dr. Adrianus Amheka, S.T, M.Eng
Chairman of ISAS

Welcome Message from Chairman of iCAST 2021

Assalamualaikum Warahmatullahi Wabarakatuh

Welcome to the the International Conference on Applied Science and Technology (iCAST) 2021. On Behalf of the conference committee, I would like to welcome all the keynote speakers, (1) Prof. Dr. Arshad Ahmad from School of Chemical and Engineering, Universiti Teknologi Malaysia, (2) Prof. Peter Sheehan from Victoria University, Melbourne Australia, (3) Mr. Teten Hadi Rustendi, Director & COO of PT. Badak NGL, (4) Mr. Muhammad Yamin, Presiden Director of Bank Kaltimara.



This year, iCAST 2021 is being conducted in Samarinda, East Kalimantan, Indonesia. And in respect to the covid-19 pandemic, iCAST 2021 is held on a hybrid conference for ceremony and the panelist presentation by online. This conference conducts two track: Engineering Science (iCAST ES) and Technology Social Science (iCAST SS).

iCAST 2021 aimed to meet the demands of the academia and industries to give solution on Developing innovation and green technology to sustain the economic and social life in new normal during the pandemic covid 19. It is one of the most comprehensive conferences focused on solving problems occurring in industrial environments and green technology. Furthermore, future iCAST will constitute opportunity for academics and industry professionals to discuss the latest issues and progresses in the area of information science and technology. Therefore, we expect iCAST to become a significant milestone for further related research and innovation of technology.

I would like to extend my gratitude to the Keynote Speakers who have kindly supported iCAST 2021.

Furthermore, I would like to thank all organizer, supporters, ISAS and organizing committee members of iCAST 2021. The success of iCAST 2021 would not have been possible without their support and contribution

Wassalamualaikum Warahmatullahi Wabarakatuh.

Samarinda, October 23, 2021

Amiril Azizah, S.E., M.Si., Ph.D
iCAST 2021 General Chair

Guideline iCAST-ES/SS

The 4th International Conference on Applied Science and Technology (iCAST 2021)

Saturday, October 23, 2021

All time in the program schedule are in Middle Indonesia Time (WITA, GMT +8). Please pay attention and adjust in to your local time. Current time in WITA can be found on <http://time.bmkg.go.id/Jam.BMKG>.

I. Guideline for Participants

1. Online conference will be held by using Zoom.
Zoom Event will be opened 30 minutes before the event (08.00 Middle Indonesia Time, Samarinda/Makassar Time).
2. Time of Registration: 08.00 – 08.30 (local time Samarinda, GMT +8), Saturday, October 23, 2021.

II. Guideline for Presenters and Session Chair/Moderator

1. The 4th International Conference on Applied Science and Technology (iCAST) 2021 will be held on virtual conference by using Zoom web conferencing platform.
2. Please rename your display name in Zoom with the following format: Number of Room_Kode_Your complete name (Example: Room I_ES1_Amos Randa Patandung).
3. The iCAST Committee are using English Language and recording during session progress.
4. During parallel session the presenters and session chairs are asked to keep to the paper sequence as shown in the Final Program. By following the predefined schedule, participants can switch between sessions without missing the particular papers of interest.
5. The presentation time for each presenter is 15 minutes including Q&A. The session chairs should allow the presenter for a 10 minutes presentation and leave 5 minutes for discussions. All presenters are requested to report their attendance to the session chair 10 minutes before the session begins.
6. Thirty (30) zoom rooms are provided for presentations: Room 1-14 for iCAST-SS and Room 15-30 for iCAST-ES.

Conference Room

A. Opening ceremony

Zoom Virtual Conference for online participants
Hotel Mercure Samarinda, Room Crystal, 3rd floor for offline

B. Parallel Room

Parallel Session I
13.00 - 14.00 WITA

ES (Engineering Science)

Room	: Room XV
Moderator	: Alexius Leonardo Johanis, ST., MT
Track	: ES (Engineering Science)
Kode	: ES1
Room	: Room XVI
Moderator	: Amy Wadu
Track	: ES (Engineering Science)
Kode	: ES2
Room	: Room XVII
Moderator	: Wahyuni Eka Sari, S.Kom., M.Eng
Track	: ES (Engineering Science)
Kode	: ES3
Room	: Room XVIII
Moderator	: Novita Indriani, SS., MA
Track	: ES (Engineering Science)
Kode	: ES4
Room	: Room XIX
Moderator	: I Wayan Lanang N., S.ST.Par., M.Par
Track	: ES (Engineering Science)
Kode	: ES5
Room	: Room XX
Moderator	: Arief Adhiksana, S.ST., MT
Track	: ES (Engineering Science)
Kode	: ES6
Room	: Room XXI
Moderator	: Yudi Pranoto, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES7
Room	: Room XXII
Moderator	: Tien Rahayu Tulili, ST., M.Tech
Track	: ES (Engineering Science)
Kode	: ES8
Room	: Room XXIII
Moderator	: Jusuf Wilson Rafael
Track	: ES (Engineering Science)
Kode	: ES9
Room	: Room XXIV
Moderator	: Muh. Irwan, ST., MT., Ph.D
Track	: ES (Engineering Science)
Kode	: ES10

Room	: Room XXV
Moderator	: Alwathan S.T., M.Si
Track	: ES (Engineering Science)
Kode	: ES11
Room	: Room XXVI
Moderator	: Dr. Eng. Hidayat, ST., MT
Track	: ES (Engineering Science)
Kode	: ES12
Room	: Room XXVII
Moderator	: Ida Bagus Gede Widiantara
Track	: ES (Engineering Science)
Kode	: ES13
Room	: Room XXVIII
Moderator	: Ir. Herawati Budiastuti, Ph.D
Track	: ES (Engineering Science)
Kode	: ES14
Room	: Room XXIX
Moderator	: Yuli Patmawati, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES15
Room	: Room XXX
Moderator	: Dwi Cahyadi, ST., MT
Track	: ES (Engineering Science)
Kode	: ES16

Parallel Session II
14.00 - 15.00 WITA

ES (Engineering Science)

Room	: Room XV
Moderator	: Alexius Leonardo Johanis, ST., MT
Track	: ES (Engineering Science)
Kode	: ES17
Room	: Room XVI
Moderator	: Amy Wadu
Track	: ES (Engineering Science)
Kode	: ES18
Room	: Room XVII
Moderator	: Wahyuni Eka Sari, S.Kom., M.Eng
Track	: ES (Engineering Science)
Kode	: ES19
Room	: Room XVIII
Moderator	: Novita Indriani, SS., MA
Track	: ES (Engineering Science)
Kode	: ES20
Room	: Room XIX
Moderator	: I Wayan Lanang N., S.ST.Par., M.Par
Track	: ES (Engineering Science)
Kode	: ES21

Room	: Room XX
Moderator	: Arief Adhiksana, S.ST., MT
Track	: ES (Engineering Science)
Kode	: ES22
Room	: Room XXI
Moderator	: Yudi Pranoto, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES23
Room	: Room XXII
Moderator	: Tien Rahayu Tulili, ST., M.Tech
Track	: ES (Engineering Science)
Kode	: ES24
Room	: Room XXIII
Moderator	: Jusuf Wilson Rafael
Track	: ES (Engineering Science)
Kode	: ES25
Room	: Room XXIV
Moderator	: Muh. Irwan, ST., MT., Ph.D
Track	: ES (Engineering Science)
Kode	: ES26
Room	: Room XXV
Moderator	: Alwathan S.T., M.Si
Track	: ES (Engineering Science)
Kode	: ES27
Room	: Room XXVI
Moderator	: Dr. Eng. Hidayat, ST., MT
Track	: ES (Engineering Science)
Kode	: ES28
Room	: Room XXVII
Moderator	: Ida Bagus Gede Widianara
Track	: ES (Engineering Science)
Kode	: ES29
Room	: Room XXVIII
Moderator	: Ir. Herawati Budiastuti, Ph.D
Track	: ES (Engineering Science)
Kode	: ES30
Room	: Room XXIX
Moderator	: Yuli Patmawati, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES31
Room	: Room XXX
Moderator	: Dwi Cahyadi, ST., MT
Track	: ES (Engineering Science)
Kode	: ES32

Paralel Session III
15.00 - 16.00 WITA

ES (Engineering Science)

Room	: Room XV
Moderator	: Alexius Leonardo Johanis, ST., MT
Track	: ES (Engineering Science)
Kode	: ES33
Room	: Room XVI
Moderator	: Amy Wadu
Track	: ES (Engineering Science)
Kode	: ES34
Room	: Room XVII
Moderator	: Wahyuni Eka Sari, S.Kom., M.Eng
Track	: ES (Engineering Science)
Kode	: ES35
Room	: Room XVIII
Moderator	: Novita Indriani, SS., MA
Track	: ES (Engineering Science)
Kode	: ES36
Room	: Room XIX
Moderator	: I Wayan Lanang N., S.ST.Par., M.Par
Track	: ES (Engineering Science)
Kode	: ES37
Room	: Room XX
Moderator	: Arief Adhiksana, S.ST., MT
Track	: ES (Engineering Science)
Kode	: ES38
Room	: Room XXI
Moderator	: Yudi Pranoto, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES39
Room	: Room XXII
Moderator	: Tien Rahayu Tulili, ST., M.Tech
Track	: ES (Engineering Science)
Kode	: ES40
Room	: Room XXIII
Moderator	: Jusuf Wilson Rafael
Track	: ES (Engineering Science)
Kode	: ES41
Room	: Room XXIV
Moderator	: Muh. Irwan, ST., MT., Ph.D
Track	: ES (Engineering Science)
Kode	: ES42

Room	: Room XXV
Moderator	: Alwathan S.T., M.Si
Track	: ES (Engineering Science)
Kode	: ES43
Room	: Room XXVI
Moderator	: Dr. Eng. Hidayat, ST., MT
Track	: ES (Engineering Science)
Kode	: ES44
Room	: Room XXVII
Moderator	: Ida Bagus Gede Widiantera
Track	: ES (Engineering Science)
Kode	: ES45
Room	: Room XXVIII
Moderator	: Ir. Herawati Budiastuti, Ph.D
Track	: ES (Engineering Science)
Kode	: ES46
Room	: Room XXIX
Moderator	: Yuli Patmawati, ST., M.Eng
Track	: ES (Engineering Science)
Kode	: ES47
Room	: Room XXX
Moderator	: Dwi Cahyadi, ST., MT
Track	: ES (Engineering Science)
Kode	: ES48

C. Closing

Zoom Virtual Conference for online participans
Hotel Mercure Samarinda, Room Crystal, 3rd flor for offline

Registration and Information

1. Zoom Virtual Conference for online participans

Link : <https://us02web.zoom.us/j/81827995462?pwd=MHZ4d3BpUUlVSVFZ5aDExcm91S2JxQT09>

Meeting ID: 818 2799 5462

Passcode: iCAST2021



2. Hotel Mercure Samarinda, Room Crystal, 3rd flor for offline speaker and committee
Mulawarman Street No.171, Pelabuhan, Kec. Samarinda Kota, Samarinda, Kalimantan Timur 75112

Technical Program

RUNDOWN

The 4th International Conference on Applied Science and Technology (iCAST 2021)

Saturday, October 23, 2021

08.00 - 16.40 WITA (Indonesian Time) / 10.00 - 18.40 (Melbourne Time)

Time (WITA)	Schedule	Note
Opening Ceremony		
08.00 - 08.10	Opening	MC
08.10 - 08.20	Singing Indonesia National Anthem “Indonesia Raya” And Marching Song of State Polytechnic of Samarinda	MC
08.20 - 08.25	Opening Prayer	Abdul Halik, S.Pd., M.T.
08.25 - 08.30	iCAST Profile Video	MC
08.30 - 08.40	Welcome Remark from General Chair of iCAST 2021	Amiril Azizah, S.E., M.Si., Ph.D.
08.40 - 08.50	Welcome Remark from Chairman of ISAS	Prof. Dr. Adrianus Amheka, S.T., M.Eng.
08.50 - 09.00	POLNES Profile Video	MC
09.00 - 09.10	Welcome Remark from Director of State Polytechnic of Samarinda	Ramli, S.T., M.Eng.
09.10 - 09.20	Welcome Remark from Chairman of Indonesia Polytechnic Director Forum	Dr. Zainal Arief, S.T., M.T.
09.20 - 09.30	Cultural and dance performances “Tari Enggang”	MC
09.30 - 09.50	Welcome Remark from Director General of Vocational Education & Officially Opening iCAST 2021	Wikan Sakarinto, S.T., M.Sc., Ph.D.
09.50 - 10.00	Coffee Break	
Keynote Speech		
10.00 - 10.30	Speaker 1 Director & COO PT Badak NGL	Teten Hadi Rustendi
10.30 - 11.00	Speaker 2 President Director Bank Kaltimara	Muhammad Yamin
11.00 - 11.30	Keynote Speaker 1	Prof. Dr. Arshad Ahmad
11.30 - 12.00 / <i>13.30 - 14.00</i>	Keynote Speaker 2	Prof. Peter Sheehan
12.00 - 13.00	Lunch	-

13.00 - 14.00	Paper Presentation Session 1	Attached
14.00 - 15.00	Paper Presentation Session 2	Attached
15.00 - 16.00	Paper Presentation Session 3	Attached
16.00 - 16.10	Coffee Break	
16.10 - 16.20	Announcement of the best paper	-
16.20 - 16.30	Announcement of the next iCAST 2022	-
16.30 - 16.40	Closing Remark from Chairman of Indonesia Polytechnic Director Forum	Dr. Zainal Arief, S.T., M.T.

Attachment:

1. List of Parallel Session

ENGINEERING SCIENCE

Session I

13.00 - 14.00 WITA

Room: Room XV - XXX

Kode: ES1 - ES16

No. 1 - 64

Session I

13.00 - 14.00 WITA

Moderator : Alexius Leonardo Johanis, ST., MT

Track : ES (Engineering Science)

Room : Room XV**Kode : ES -1**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
1	13.00 - 13.15	1570734844	Design of Brackish Water Distillation Using Cylindrical and Square Types of Solar Radiation Absorbers Made of Galvanized Base for Coastal Communities	Dedy Nataniel Uly, Agus Laka, Lukas Lantang and Bernadus Stefanus Wuwur (Politeknik Negeri Kupang, Indonesia)
2	13.15 - 13.30	1570743877	A Trial Study on Samarinda Identity Element Extraction for The Development of Cake Packaging Design	Andi Farid Hidayanto (Politeknik Negeri Samarinda, Indonesia); Basyarah Binti Hamat (Universiti Teknologi Malaysia, Malaysia); Mohd Khairulanwar Bin Mohd Dahuri (Universiti Teknologi Malaysia, Indonesia)
3	13.30 - 13.45	1570748386	Effect of Waste Valve Tuning on Hydraulic ram pump efficiency	Alexius Leonardo Johanis and Rafael Mado (Politeknik Negeri Kupang, Indonesia); Hero Preasly Dida (Politeknik Negei Kupang, Indonesia)
4	13.45 - 14.00	1570742117	Real-time Hypertext Transfer Protocol Intrusion Detection System on Web Server using Firebase Cloud Messaging	Agus Tedyyana (Politeknik Negeri Bengkalis, Indonesia); Osman Ghazali (Universiti Utara Malaysia, Malaysia)

Session I

13.00 - 14.00 WITA

Moderator : Amy Wadu

Track : ES (Engineering Science)

Room : Room XVI**Kode : ES -2**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
5	13.00 - 13.15	1570741269	Improvement Of Traffic Performance At Intersections on Cak Doko Street, Kupang City, Indonesia	Amy Wadu, Mateus Sodanango, Johan Lada and Obed Nenobais (Politeknik Negeri Kupang, Indonesia)
6	13.15 - 13.30	1570736370	Impact of the Covid-19 Pandemic on Traffic Performance on Urban Roads in Kupang City, Indonesia	Amy Wadu, Mateus Sodanango and Zulfiani Ar (Politeknik Negeri Kupang, Indonesia)
7	13.30 - 13.45	1570745959	Transaction Application Management Through Wireless Lan For Small and Medium Enterprises	I Made Ari Dwi Suta Atmaja, I Nyoman Gede Arya Astawa, Ni Wayan Wisswani and I Made Riyan Adi Nugroho (Politeknik Negeri Bali, Indonesia); Putu Wijaya Sunu (Bali State Polytechnic, Indonesia)
8	13.45 - 14.00	1570760221	The Effect Of Air Flow Rate On The Production Of Active Charcoal From Palm Oil Shells With Partial Oxidation Method	Firman Firman and Sitti Sahraeni (Politeknik Negeri Samarinda, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Wahyuni Eka Sari, S.Kom., M.Eng

Track : ES (Engineering Science)

Room : Room XVII

Kode : ES -3

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
9	13.00 - 13.15	1570741907	Study of the Use of Drywall as the Wall Cover Material Reviewed From Cost and Time Aspects	Ni Kadek Sri Ebtha Yuni, I Wayan Sudiasa and I Nyoman Suardika (Politeknik Negeri Bali, Indonesia)
10	13.15 - 13.30	1570740161	Comparative Analysis of the Energy Supply of Poly and Mono Crystalline Solar Panels in the Rooftop On Grid	I Nyoman Sugiarta (Electrical Engineering, Politeknik Negeri Bali, Indonesia); I Nengah Suparta and I Wayan Teresna (Politeknik Negeri Bali, Indonesia)
11	13.30 - 13.45	1570739876	Solution Treatment AC8A Aluminum With Aging Temperature Variations On Density, Hardness And Micro Structure	Roymons Jimmy Dimu, Antonius Pangalanan and Oktovianus Dharma Rerung (Politeknik Negeri Kupang, Indonesia); Mamik Mardyaningsih (State Polytechnic of Kupang, Indonesia); Yanes Boimau (Politeknik Negeri Kupang, Indonesia)
12	13.45 - 14.00	1570736712	Factorial Identification On Surface Hardness Of Cut Low Carbon Steel With Hardening Process Using Manganese Minerals Powder	Oktovianus Dharma Rerung, Fransiskus Sapar and Roymons Jimmy Dimu (Politeknik Negeri Kupang, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Novita Indriani, SS., MA

Track : ES (Engineering Science)

Room : Room XVIII

Kode : ES -4

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
13	13.00 - 13.15	1570736156	Dynamic Web Workload Distribution Test From 0 Rps To 1000 Rps On Cluster-Based Web Server System With Locality-Based Least Connection Algorithm	Nongki Angsar (Kupang State Polytechnic, Indonesia); Maria Badjowawo (State Polytechnic of Kupang, Indonesia); Marthen Dangu Elu Beily (Politeknik Negeri Kupang, Indonesia)
14	13.15 - 13.30	1570743062	Designing an Integrated Public Complaint System Regarding Public Services Using the Scrum Method	Fajar Ratnawati and Muhammad Asep Subandri (Politeknik Negeri Bengkalis, Indonesia)
15	13.30 - 13.45	1570735807	The Effect of Large Variation of Steering Angle on the Performance of the Elliptical Savonius Wind Turbine	Agus Laka, Dedy Nataniel Uly, Bernadus Wuwur and Bruno Liu (Politeknik Negeri Kupang, Indonesia)
16	13.45 - 14.00	1570745075	Google Earth Engine for Assessing Land Use and Land Cover Change in Banyuwangi Regency	Abdul Holik, Zulis Erwanto and Siska Aprilia Hardiyanti (Politeknik Negeri Banyuwangi, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : I Wayan Lanang N., S.ST.Par., M.Par

Track : ES (Engineering Science)

Room : Room XIX

Kode : ES -5

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
17	13.00 - 13.15	1570745140	Effect of High Speed Machining on The Turning Aluminum Alloy 6061 of The Integrity Coated TiAlN/TiN Cutting Tool Carbide	Sunarto Narto (Politeknik Negeri Bengkalis, Indonesia)
18	13.15 - 13.30	1570745276	Preliminary Study of Solar PV Characteristics Cooled By Water Spray	Putu Wijaya Sunu, Daud Simon Anakottapary and I Dewa Made Susila (Bali State Polytechnic, Indonesia); Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia); I Nyoman Eddy Indrayana (Politeknik Negeri Bali, Indonesia); Asrori Asrori (Politeknik Negeri Malang, Indonesia); Andoko Andoko (State University of Malang, Indonesia); Ketut Suarsana (Universitas Udayana, Indonesia); C. Bambang Dwi Kuncoro (National Chin-Yi University of Technology, Taiwan)
19	13.30 - 13.45	1570745287	Thermal Performance of Hot Water System Produced by Air Conditioning Coupled with Heat Recovery	Putu Wijaya Sunu (Bali State Polytechnic, Indonesia); I M Suarta (Politeknik Negeri Bali, Indonesia); Daud Simon Anakottapary (Bali State Polytechnic, Indonesia); C. Bambang Dwi Kuncoro (National Chin-Yi University of Technology, Taiwan); Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia); I Dewa Made Cipta Santosa and I Made Ari Dwi Suta Atmaja (Politeknik Negeri Bali, Indonesia); Ketut Suarsana (Universitas Udayana, Indonesia); I Wayan Edi Arsawan (Bali State Polytechnic, Indonesia)
20	13.45 - 14.00	1570738631	The Effect of Pump House Layout and Compressor Tube Volume Variations on Efficiency of 2 Inch Hydraulic Ram Pump Performance	Rafael Mado, Frans Mangngi, Alexius Leonardo Johanis and Irene Budayawati (Politeknik Negeri Kupang, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Arief Adhiksana, S.ST., MT

Track : ES (Engineering Science)

Room : Room XX

Kode : ES -6

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
21	13.00 - 13.15	1570745804	A Design Of A Tool Of Car Brake Piston Caliper Remover With Pneumatic Power	I M Suarta and I P G Sopan Rahtika (Politeknik Negeri Bali, Indonesia); Putu Wijaya Sunu, I Gede Santosa and Ketut Bangse (Bali State Polytechnic, Indonesia)
22	13.15 - 13.30	1570745809	Influence of Carbon-Activated Foam to Gain Fresh Water Production on Ultrasonic Vibration Assisted Water Purification System	Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia); Putu Wijaya Sunu and I Nyoman Suamir (Bali State Polytechnic, Indonesia); Wayan Nata Septiadi (Univeritas Udayana, Indonesia); I Gede Santosa (Bali State Polytechnic, Indonesia); I M Suarta, I Wayan Temaja and Nyoman Sugiarta (Politeknik Negeri Bali, Indonesia)
23	13.30 - 13.45	1570737107	Experiment Design For Manufacturing Quality Kitchen Knife Materials Using Carbon Steel With Hard Facing Technology And Hot Forging Process	Fransiskus Sapar, Oktovianus Dharma Rerung, Roymons Jimmy Dimu and Abdul Muttaqin (Politeknik Negeri Kupang, Indonesia)
24	13.45 - 14.00	1570746001	Identification of Land Criticism for Land Conservation Actions in The Badeng Watershed with Regulation of Watershed and Protection Forest Management	Zulis Erwanto and Abdul Holik (Politeknik Negeri Banyuwangi, Indonesia); Dadang Pranowo (Banyuwangi State Polytechnic, Indonesia); Shinta Afifa (Politeknik Negeri Banyuwangi, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Yudi Pranoto, ST., M.Eng

Track : ES (Engineering Science)

Room : Room XXI**Kode : ES -7**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
25	13.00 - 13.15	1570747244	Porous Concrete Paving Block: A review of Clogging Mechanism and Durability	Yudi Pranoto (Samarinda State Polytechnic, Indonesia); Nor Fazilah Mohd Hashim (Universiti Teknologi Malaysia, Malaysia); Tumingan Sabar and Joko Suryono (Politeknik Negeri Samarinda, Indonesia)
26	13.15 - 13.30	1570749110	The Effect of Mahakam Sand on the Mechanical and Durability of Porous Concrete Paving Blocks	Yudi Pranoto (Samarinda State Polytechnic, Indonesia); Nor Fazilah Mohd Hashim (Universiti Teknologi Malaysia, Malaysia); Tumingan Sabar and Ashadi Putrawirawan (Politeknik Negeri Samarinda, Indonesia)
27	13.30 - 13.45	1570747977	Development Of 12 Volt Voltage Heating Element Model Using Solar Energy	Syahrul Bahari, Shadi Rolaskhi and Rosmiati SE MSi (Politeknik Negeri Kupang, Indonesia); Muntasir (University of Muhammadiyah Kupang)
28	13.45 - 14.00	1570748076	A Systematic Literature Review on Hybrid Deep Learning Smart Recommendation Systems	Kadek Cahya Dewi (Bali State Polytechnic, Indonesia); Putu Indah Ciptayani and Putu Adriani Prayustika (Politeknik Negeri Bali, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Tien Rahayu Tulili, ST., M.Tech

Track : ES (Engineering Science)

Room : Room XXII**Kode : ES -8**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
29	13.00 - 13.15	1570748198	Profile of Energy Consumption on Split Air Conditioning at Various Temperature Controls	I Nengah Ardita, I Gusti Agung Bagus Wirajati, S Sudirman and I Dewa Made Susila (Bali State Polytechnic, Indonesia)
30	13.15 - 13.30	1570750039	Shore Protection Structures on the coast of Biduk-Biduk District, Indonesia	Tommy Ekamitra Sutarto and Insan Kamil (Politeknik Negeri Samarinda, Indonesia)
31	13.30 - 13.45	1570736034	Diesel Engine Performance With Diesel and Biodiesel Fuel From VCO On The High Load	Aris Palinggi, Lukas Lantang, Bernandus (Politeknik Negeri Kupang, Indonesia)
32	13.45 - 14.00	1570748534	Research of Occupational Safety and Health (OSH) Implementation of Work in Electrical Distribution Network in Bali Area	I Nyoman Mudiana, I Made Budiana, I. G. K. Abasana and Gede Wahyu Antara, K. (Politeknik Negeri Bali, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Jusuf Wilson Meynerd Rafael

Track : ES (Engineering Science)

Room : Room XXIII

Kode : ES -9

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
33	13.00 - 13.15	1570749773	Mobility for long-distance: how people choose transportation in the Covid-19 pandemic era?	Priska Gardeni Nahak (Politeknik Negeri Kupang, Indonesia); Theodorus Paling and Anastasia Muda (State Polytechnic of Kupang, Indonesia)
34	13.15 - 13.30	1570749812	Preliminary Design of Micro Hydro Portable Screw Archimedes with Transmission System in Small irrigation channel	I Kadek Ervan Hadi Wiryanta (Bali State Polytechnic, Indonesia); Achmad Wibolo (Politenik Negeri Bali, Indonesia)
35	13.30 - 13.45	1570748543	The Performance of Electric Vehicles Converted from Combustion Motorcycles	I Wayan Jondra (Electrical Engineering & Politeknik Negeri Bali, Indonesia); I Gusti Agung Made Sunaya, I Gusti Arka and I Ketut Parti (Politeknik Negeri Bali, Indonesia); Sudiarta I Wayan (Indonesia & Electrical Engenering Politeknik Negeri Bali, Indonesia); I Gede Suputra Widharma (Politeknik Negeri Bali, Indonesia)
36	13.45 - 14.00	1570748510	The Energy Saving Through Live Line Pedestal Insulator Washing with Snow Shampoo	I Wayan Jondra and I N Sunaya (Electrical Engineering & Politeknik Negeri Bali, Indonesia); I Ketut Suryawan, Djoko Suhantono, I Made Sajayasa and I Nyoman Sukarma (Politeknik Negeri Bali, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Muh. Irwan, ST., MT., Ph.D

Track : ES (Engineering Science)

Room : Room XXIV

Kode : ES -10

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
37	13.00 - 13.15	1570748532	A low cost electricity monitoring wireless sensor network	Prihadi Murdiyati and Abdul Kurniawan (Politeknik Negeri Samarinda, Indonesia); Marson Ady Putra (Institut Teknologi Sepuluh Nopember, Indonesia); Khairuddin Karim and Supian Nor (Politeknik Negeri Samarinda, Indonesia)
38	13.15 - 13.30	1570748581	Simulation of Water Supply Pump System with PLC Based Control	S Sudirman (Bali State Polytechnic, Indonesia); I Nyoman Gede Baliarta (Politeknik Negeri Bali, Indonesia); Putu Darmawa (Bali State Polytechnic, Indonesia); Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia)
39	13.30 - 13.45	1570748589	Analysis of Project Time Performance During Covid-19 Pandemic on The Construction of Service Building at RSUD Gianyar by using The Earned Value Method	Made Sudiarsa, I Wayan Sudiasa and Gede Sastra Wibawa (Politeknik Negeri Bali, Indonesia)
40	13.45 - 14.00	1570748676	Experimental Study On The Effect Of Intercooler On A Compressor Performance On Multistage Type Cold-Storage Simulation	Putu Sastra Negara (Bukit Jimbaran Badung Bali Indonesia, Indonesia); I Made Arsawan (Politeknik Negeri Bali, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Alwathan S.T., M.Si

Track : ES (Engineering Science)

Room : Room XXV

Kode : ES -11

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
41	13.00 - 13.15	1570748818	Processing of Browncoal from Kutai Kertanegara - East Kalimantan as Adsorbent Media	Alwathan Sofyan (Politeknik Negeri Samarinda - Kalimantan Timur, Indonesia); Dedi Irawan (Politeknik Negeri Samarinda, Indonesia)
42	13.15 - 13.30	1570748821	Analysis Of Nusa Dua Estuary Dam Operations For Clean Water Supply South Badung Tourism Area	I Gusti Lanang Made Parwita, I Made Tapa Yasa, I Wayan Wiraga, and I Nyoman Anom (Politeknik Negeri Bali, Indonesia)
43	13.30 - 13.45	1570759076	Study Of The Potential And Utilization Of Springs For Clean Water Supply To Supporting Tourism Development In The North Badung Regency	I Gusti Lanang Made Parwita, I Made Tapayasa, Made Mudhina, Ketut Wiwin Andayani, I Nyoman Sedana Triadi (Politeknik Negeri Bali, Indonesia)
44	13.45 - 14.00	1570759074	Clean Water Supply Policy To Support Tourism Activities In Gianyar Regency	I Gusti Lanang Made Parwita, Made Mudhina AND I Wayan Wiraga (Politeknik Negeri Bali, Indonesia); IGB Sila Dharma, Mawiti Inftri Yekti and I Putu Gustave Sryantara (Udayana University, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Dr. Eng. Hidayat, ST., MT

Track : ES (Engineering Science)

Room : Room XXVI**Kode : ES -12**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
45	13.00 - 13.15	1570748975	Land Boundary Map and Land Contour Map for Tourism Accommodation Development Using QGIS Software Application in Kalisada Village, Bali	Gede Yasada (Politeknik Negeri Bali, Indonesia); Evin Yudhi Setyono (Bali State Polytechnic, Indonesia)
46	13.15 - 13.30	1570749047	Assessing Individual Fitness for Research and Development Position using Fuzzy AHP and Pareto: Case Study in Manufacturing Industry	I Made Ronyastra, Evy Herowati, Joniarto Parung, Rahman Wahyudi and Christanto Henadi (Universitas Surabaya, Indonesia)
47	13.30 - 13.45	1570747950	The Application of Fluttering Thin-Flat Plates for Wind Harvesting Using Electromagnetic Converters	I P G Sopan Rahtika and I M Suarta (Politeknik Negeri Bali, Indonesia); I Komang Rusmariadi (Bali State Polytechnic, Indonesia)
48	13.45 - 14.00	1570749151	Performance and Energy Consumption Analysis of Freezer Machines For Mobile Ice Cream Sellers Using Eco-Friendly Refrigerant MC134	I Dewa Made Susila, Daud Simon Anakottapary, I Wayan Adi Subagia, Putu Wijaya Sunu, and I Nengah Ardita (Bali State Polytechnic, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Ida Bagus Gede Widiantara

Track : ES (Engineering Science)

Room : Room XXVII**Kode : ES -13**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
49	13.00 - 13.15	1570749417	The Effect of Condenser Cooling to Coefficient of Performance (COP) and Electrical Consumption on AC Split	Ida Bagus Gede Widiantara and I Wayan Suastawa Suastawa (Politeknik Negeri Bali, Indonesia)
50	13.15 - 13.30	1570749420	Design Of Grated Coconut Roasting Machine Through Ergonomic Approach To Increase Work Productivity	Ketut Gde Juli Suarbawa and Ngurah Bagus Mulawarman (Politeknik Negeri Bali, Indonesia)
51	13.30 - 13.45	1570749477	Analysis Performance of Full Direct Current (DC) Refrigerator Medium Temperature	I Dewa Made Cipta Santosa and I Gede Nyoman Suta Waisnawa (Politeknik Negeri Bali, Indonesia); Putu Wijaya Sunu (Bali State Polytechnic, Indonesia)
52	13.45 - 14.00	1570750455	Analysis of Display Cabinet Temperature and Humidity Condition for Fresh Fish displayed	I Dewa Made Cipta Santosa, I Gede Nyoman Suta Waisnawa, I Gusti Agung Bagus Wirajati, I Gede Thio Cahya Dinata, I Komang Raditya Cahya Dinata (Bali State Polytechnic, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Ir. Herawati Budiastuti, Ph.D

Track : ES (Engineering Science)

Room : Room XXVIII

Kode : ES -14

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
53	13.00 - 13.15	1570749618	Decision Support System for Exported Grade Coffee Selection using AHP and TOPSIS	Putu Indah Ciptayani, Ni Gusti Ayu Putu Harry Saptarini and Putu Manik Prihatini (Politeknik Negeri Bali, Indonesia)
54	13.15 - 13.30	1570749645	Analysis of The Use of Ergonomic Trolley On Musculoskeletal Complaints On Worker Transporting Gallons of Water and LPG 12 Kg	I Gede Santosa (Bali State Polytechnic, Indonesia); NI Kadek Muliati (Politeknik Negeri Bali, Indonesia)
55	13.30 - 13.45	1570749668	Counseling System Lecturer for Bali State of Polytechnic Students	Putu Gde Sukarata, I Gede Suputra Widharma, I Gde Nyoman Sangka, I Made Wiryawan, I Gusti Abasana and I Wayan Candra Winetra (Politeknik Negeri Bali, Indonesia)
56	13.45 - 14.00	1570749705	A Design System for Radio Broadcasting Application with News Agent	I Ketut Gede Sudiarta and Putu Manik Prihatini (Politeknik Negeri Bali, Indonesia); Purbhawa I Made (Bali State Polytechnic, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Yuli Patmawati, ST., M.Eng

Track : ES (Engineering Science)

Room : Room XXIX

Kode : ES -15

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
57	13.00 - 13.15	1570748522	Synthetic Dye Removal of Methylene Blue on Adsorption Process Using Low-Rank Coal of East Kalimantan	Yuli Patmawati (Politeknik Negeri Samarinda - Kalimantan Timur, Indonesia); Ibnu Rahayu (Polytecnic State of Samarinda, Indonesia)
58	13.15 - 13.30	1570748544	Local Microorganisms Bioactivator From Banana Weevil on Tofu Industrial Wastewater Treatment in Samarinda City	Yuli Patmawati (Politeknik Negeri Samarinda - Kalimantan Timur, Indonesia)
59	13.30 - 13.45	1570749846	Metallization Development of Multi-walled Carbon Nanotubes (MWCNTs) with Copper by an electroless plating	I Dewa Made Pancarana and I Nyoman Budiartana (Politeknik Negeri Bali, Indonesia)
60	13.45 - 14.00	1570750031	Visualization of the Spread of Covid-19 in East Nusa Tenggara Using the K-Means Data Mining Classification Method	Lita Alfriany Ndoloe (Politeknik Negeri Kupang, Indonesia); Petrisia Sudarmadji and Christa Bire (State Polytechnic of Kupang, Indonesia)

Session I

13.00 - 14.00 WITA

Moderator : Dwi Cahyadi, ST., MT

Track : ES (Engineering Science)

Room : Room XXX

Kode : ES-16

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
61	13.00 - 13.15	1570748218	Decagon-Shaped Water Bottle Design with Ergonomic Handle	Dwi Cahyadi and Etwin Fibriane Soeprpto (Politeknik Negeri Samarinda, Indonesia); Hertina Susandari (Institut Teknologi Sepuluh Nopember Surabaya, Indonesia); Muhammad Kadafi (Politeknik Negeri Samarinda, Indonesia)
62	13.15 - 13.30	1570750044	Performance Analysis of Monocrystalline and Polycrystalline Solar Photovoltaic for Solar Water Pump (SWP) System in Indonesia	Rusman Sinaga (State Polytechnic of Kupang); Julius Tanesab (Politeknik Negeri Kupang, Indonesia); Marthen Beily (State Polytechnic of Kupang, Indonesia); Agusthinus Sampeallo (Nusa Cendana University, Indonesia)
63	13.30 - 13.45	1570750045	Response Spectrum Analysis of RC Bridge Using Indonesian Earthquake Map 2017 (Case Study: Bonak RC Bridge, TTU, NTT, Indonesia)	Valentinus E. Bano, Albert Aun Umbu Nday and Mateus Sodianango (Politeknik Negeri Kupang, Indonesia)
64	13.45 - 14.00	1570750167	Optimisation of Sustainable Clean Energy for Tourist Accommodation	I Gusti Agung Bagus Wirajati, I Dewa Made Cipta Santosa, I Bagus Aditya Jaya Pramana and I Bagus Aditya Jaya Pramana (Bali State Polytechnic, Indonesia); Ida Ayu Gede Bintang Madrini (Udayana University, Indonesia)

ENGINEERING SCIENCE

Session II

14.00 - 15.00 WITA

Room: Room XV - XXX

Kode: ES17 - ES32

No. 65 - 128

Session II

14.00 - 15.00 WITA

Moderator : Alexius Leonardo Johanis

Track : ES (Engineering Science)

Room : Room XV**Kode : ES-17**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
65	14.00 - 14.15	1570750303	Preliminary Study: Conversion of Organic Fractions in Municipal Waste in Samarinda City into Value-Added Products	Mustafa, Muh. Irwan and Faisyal (Politeknik Negeri Samarinda, Indonesia); Pramila Tumanaidu (Universiti Teknologi Malaysia, Malaysia)
66	14.15 - 14.30	1570750447	Optimization of Access Data Center (ADC) in the Management of the Administration of Procurement of Goods/Services at the Cilacap State Polytechnic	Riyadi Purwanto, Dwi Novia P, Rostika Listyaningrum (Politeknik Negeri Cilacap, Indonesia)
67	14.30 - 14.45	1570749460	Wireless Power Transmitter Apparatus for Low-Voltage DC Power Transmission Applications	C. Bambang Dwi Kuncoro and Arvanida Feizal Permana (National Chin-Yi University of Technology, Taiwan); Cornelia Adristi (Universitas Indonesia, Indonesia)
68	14.45 - 15.00	1570758614	Fulfillment of Quality of Service at Komodo Labuhan Bajo Airport to Increase Passenger Satisfaction	Anie Tuati, Deasi Delfiani Anastasia A Daud and Amy Wadu (Politeknik Negeri Kupang, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Amy Wadu

Track : ES (Engineering Science)

Room : Room XVI**Kode : ES-18**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
69	14.00 - 14.15	1570750675	Equilibrium Model and Adsorption Kinetics of Methylene Blue With Kluwak Shell Carbon	Yuliani Haroena Rasjid, A. Musfirah, Isma Ayu Ningsih Z, Ida Andriani and Haera Setiawati (Politeknik Negeri Ujung Pandang, Indonesia)
70	14.15 - 14.30	1570750683	Design of Permanent Magnetic Yoke for Subsurface Defect Detection with Magnetic Particle Inspection Methode	Mohammad Anas Fikri, Auliana Wilujeng and Muhammad Faizal Eka Prasetya Putra (Politeknik Negeri Madura, Indonesia)
71	14.30 - 14.45	1570750970	Implementation Weighted Product Method for the Best Carrot Seed Recommendations	Eunike Endariahna Surbakti (Universitas Multimedia Nusantara, Indonesia); Philipus Silaen (Universitas Bunda Mulia, Indonesia); Rahmat Widia Sembiring, Khairul Khairul and Jantianus Jantianus (Politeknik Negeri Medan, Indonesia)
72	14.45 - 15.00	1570750995	The Effect of Rebar Tie Fiber as a Concrete Mixture Material on Compressive and Tensile Strength	Joko Suryono (Politeknik Negeri Samarinda, Indonesia); Yudi Pranoto (Samarinda State Polytechnic, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Wahyuni Eka Sari, S.Kom., M.Eng

Track : ES (Engineering Science)

Room : Room XVII

Kode : ES -19

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
73	14.00 - 14.15	1570751240	Utilization Of Bottom Ash and Biogas Sludge Into Carbon Briquette as an Alternative Fuel	Theresia E.P.S. Rahayu (Politeknik Negeri Cilacap & PT. Solusi Bangun Indonesia, Indonesia); Rosita Dwityaningsih (Politeknik Negeri Cilacap, Indonesia); Mohammad Nurhilal (State Polytechnic of Cilacap, Indonesia)
74	14.15 - 14.30	1570752520	Rotary Model Corn Sheller Design To Reduce Workload And Increase Productivity	Anak Agung Mulawarman (Bali State Polytechnic, Indonesia); Ketut Gde Juli Suarbawa (Politeknik Negeri Bali, Indonesia)
75	14.30 - 14.45	1570752813	The Influence of Local Materials of Laterite Stone and Plastic Bag Waste on the Marshall Characteristics of Asphalt Concrete Wearing Course	Ashadi Putrawirawan (Politeknik Negeri Samarinda, Indonesia); Rahimah Muhammad (University Teknologi Malaysia, Malaysia); Tumingan Sabar (Politeknik Negeri Samarinda, Indonesia); Yudi Pranoto (Samarinda State Polytechnic, Indonesia)
76	14.45 - 15.00	1570760434	The Effect of Crumb Rubber Substitution and Utilization of Local Materials Laterite on Asphalt Concrete Binder - Course	Karminto Karminto, Ashadi Putrawirawan and Ibayasid (Politeknik Negeri Samarinda, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Novita Indriani, SS., MA

Track : ES (Engineering Science)

Room : Room XVIII**Kode : ES-20**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
77	14.00 - 14.15	1570753926	Strategy Analysis of Sustainable Water Supply System in Buleleng Regency	I Nyoman Sedana Triadi and Made Mudhina (Politeknik Negeri Bali, Indonesia)
78	14.15 - 14.30	1570755591	Board of Lightweight Foaming Cement	Pratikto Pratikto (State Polytechnic of Jakarta, Indonesia); Anni Susilowati (Pooliteknik Negeri Jakarta, Indonesia)
79	14.30 - 14.45	1570755663	Analysis of Precast Concrete Beam Type L Joint at Moment Maximum	A Rudi Hermawan, Eka Sasmitra Mulya (Politeknik Negeri Jakarta, Indonesia)
80	14.45 - 15.00	1570755698	A Comparison of Mini Pile Bearing Capacity Based on Sondir Data and Experimental Test	Efan Tifani (Bengkalis State Polytechnic, Indonesia); Alamsyah Alamsyah (State Polytechnic of Bengkalis, Indonesia); Indriyani Puluhulawa (Politeknik Negeri Bengkalis, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : I Wayan Lanang N., S.ST.Par., M.Par

Track : ES (Engineering Science)

Room : Room XIX

Kode : ES-21

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
81	14.00 - 14.15	1570756080	Effect of nitrate-based cetane improver on ternary higher alcohol biodiesel blends and diesel engine exhaust emissions	H.K. Imdadul (University of Malaysia); Abdi Hanra Sebayang, Arridina Susan Silitonga H.H. Masjuki, M.A. Kalam, Jassinnee Milano and Abdul Halim Shamsuddin (University Tenaga Nasional, Malaysia); H. Ibrahim, (Politeknik Negeri Medan, Indonesia)
82	14.15 - 14.30	1570756091	Friction and Wear Characteristics of Calophyllum inophyllum and Moringa oleifera Biodiesel- Blends	M.H. Mosarof (University of Malaysia); A.S. Silitonga, Abdi Hanra Sebayang, Jassinnee Milano, Abdul Halim Shamsuddin, (University Tenaga Nasional, Malaysia); H.H. Masjuki, M.A Kalam and Burhanuddin Tarigan (Politeknik Negeri Medan, Indonesia)
83	14.30 - 14.45	1570756099	Tribological Study of Biolubricant made from Blend of Waste Cooking oil and Calophyllum Inophyllum oil	Jassinnee Milano, Abdul Halim Shamsuddin, (University Tenaga Nasional, Malaysia); Abdi Hanra Sebayang, Arridina Susan Silitonga, Bambang Sugiyanto, Supriyanto and Abdul Razak Isman Harianda (Politeknik Negeri Medan, Indonesia)
84	14.45 - 15.00	1570757843	Performance Of TEC Cooler Box Using Water Cooling And Coolant	Luh Putu Ike Midiani, I Wayan Adi Subagia, Made Ery Arsana, Agus Permana Putra, Kadek Suata and Okky Prasetyo (Bali State Polytechnic, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Arief Adhiksana, S.ST., MT

Track : ES (Engineering Science)

Room : Room XX

Kode : ES-22

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
85	14.00 - 14.15	1570758697	Implementation of Ultraviolet-Type C and Ozone Based On Android Home Smartphone for Room and Air Sterilization	Ade Gah, Sumartini Dana and Indranata Utama Panggalo (Politeknik Negeri Kupang, Indonesia)
86	14.15 - 14.30	1570757909	Automated Stock Market Investment Transaction Decision Making Mechanism Using Deep Reinforcement Learning	Muhammad Farman Andrijasa and Tien Rahayu Tulili (Politeknik Negeri Samarinda, Indonesia)
87	14.30 - 14.45	1570758109	Analysis of Impact Strength and Fracture Pattern of Hybrid Composite Materials Reinforced with Lontar and Gebang Midrib Fibers	Amros Alfonsius Tuati and Dedi Ully (State Polytechnic of Kupang, Indonesia); Edwin Pieter Hattu (Politeknik Negeri Kupang, Indonesia)
88	14.45 - 15.00	1570758117	Study Of The Effectiveness Of Lightning Protection System (LPS) On 1 MWp Bangli Solar Power Plant	Ida Bagus Ketut Sugirianta (Politeknik Negeri Bali); I Gusti Ngurah Agung Dwijaya Saputra, I N Mudiana and I Ketut Ta (Politeknik Negeri Bali, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Yudi Pranoto, ST., M.Eng

Track : ES (Engineering Science)

Room : Room XXI

Kode : ES-23

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
89	14.00 - 14.15	1570758122	Energy Mix Simulation to Reach Regional Energy Strategy: A National Impact of East Nusa Tenggara Province Energy Mix	Adrianus Amheka (State Polytechnic of Kupang, Indonesia); Julius Tanesab (Politeknik Negeri Kupang, Indonesia); Nonce Farida Tuati, nonce (Politeknik Negeri Kupang & Jurusan Akuntansi, Indonesia); Kathleen Aviso and Krista Danielle Yu (De La Salle University, Philippines)
90	14.15 - 14.30	1570758141	Comparison Of Comfort Level Using Air Suspension With Electric Control (2.5 Bar) And Factory Standard Hydraulic Suspension On A 2011 Vario 110 Cc Motorbike Unit	Ruspita Sihombing, Rizky S. P. Rinda, Hidayat Hidayat, Samen Lolongan and Rachelia Hutabarat (Politeknik Negeri Samarinda, Indonesia)
91	14.30 - 14.45	1570758152	Characteristics of Sediment Material at Bengkalis River Bengkalis Regency, Riau	Dedi Enda (Teacher & Politeknik Negeri Bengkalis, Indonesia); Zulkarnain Zulkarnain (Politeknik Negeri Bengkalis, Indonesia); Oni Febriani (Politeknik Negeri Bengkalis & Riau Indonesia, Indonesia)
92	14.45 - 15.00	1570758265	Gesture Recognizing using Naïve Bayes Algorithm and a Leap Motion	Daniel Pamungkasa and Sonny Hendratmo (Politeknik Negeri Batam, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Tien Rahayu Tulili, ST., M.Tech

Track : ES (Engineering Science)

Room : Room XXII

Kode : ES-24

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
93	14.00 - 14.15	1570758280	Impact of land use change on surface runoff in Manikin basin et Kupang regency	Arnoldus Nama, Yacob Hayer and Fabianus Nope (Politeknik Negeri Kupang, Indonesia)
94	14.15 - 14.30	1570758604	IoT Based Lithium-Ion Battery Pack Performance Monitoring	Murie Dwiyaniti MD, Luthfi Rahman Nova Kusuma, Tohazen, Nuha Nadhiroh and Sri Lestari (Politeknik Negeri Jakarta & Universitas Indonesia, Indonesia)
95	14.30 - 14.45	1570750515	Preparation of Kerosene from Lubricating Oil Waste Using Microwave-Assisted and Activated Carbon Pyrolysis from Lignite	Marinda Rahim, Mardhiyah Nadir, Fitriyana Fitriyana and Wanda Syahira (Politeknik Negeri Samarinda, Indonesia)
96	14.45 - 15.00	1570758627	Technical Overview of Port Terminal Services Ferry Seba Sabu Raijua	Deasi Delfiani Anastasia A Daud and Anie Tuati (Politeknik Negeri Kupang, Indonesia); Yacop Hayer (Civil Engineering, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Jusuf Wilson Meynerd Rafael

Track : ES (Engineering Science)

Room : Room XXIII

Kode : ES-25

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
97	14.00 - 14.15	1570757906	The partial substitution influence of fine aggregate with egg tray waste in the green concrete production	Jusuf Wilson Meynerd Rafael, Alokabel Alo Koilal, Alva Yuventus Lukas and Abia Erasmus Mata (Politeknik Negeri Kupang, Indonesia)
98	14.15 - 14.30	1570758787	Analysis Of Farmland Potency To Improve Community Economy In Letbaun Village Semau Sub-District Kupang District East Nusa Tenggara Province	Sutirto Jatayu, Yunus Fallo and Amy Wadu (Politeknik Negeri Kupang, Indonesia)
99	14.30 - 14.45	1570758791	Virtual Reality Simulator for Cardiopulmonary Resuscitation (CPR) as Lifesaving Method in Many Emergencies Patients	Moh. Zikky, Kholid Fathoni, Ashafidz Dianta and Miftakhul Firdaus (Politeknik Elektronika Negeri Surabaya, Indonesia)
100	14.45 - 15.00	1570758794	Study the Effect Diffuser Length and Degree to Horizontal Wind Turbine	Fatahul Arifin (Politeknik Negeri Sriwijaya, Indonesia & National Kaohsiung University Science and Technology, Indonesia); Rd. Kusumanto, Yohandri Bow, Rusdianasari Rusdianasari and Ahmad Taqwa (Politeknik Negeri Sriwijaya, Indonesia); Afries Susandi (PT. Bukit Asam Tbk, Indonesia); Yusuf Herlambang (Politeknik Negeri Semarang, Indonesia); Min Wang (National Kaohsiung University Science Technology, Taiwan); Carlos R Sitompul (Politeknik Negeri Sriwijaya, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Muh. Irwan, ST., MT., Ph.D

Track : ES (Engineering Science)

Room : Room XXIV**Kode : ES-26**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
101	14.00 - 14.15	1570758816	Design and Implementation of Portable and Prospective Embedded System And IoT Laboratory Kit Modules	Era Madona, Yulastri, Anggara Nasution and M. Irmansyah (Politeknik Negeri Padang, Indonesia)
102	14.15 - 14.30	1570758866	Effect of material type, temperature, and layer thickness on PLA and PETG from 3D printer products by tensile test	Etik Puspitasari, Syamsul Hadi and Moh. Hartono (Politeknik Negeri Malang, Indonesia)
103	14.30 - 14.45	1570758915	Dock Clustering Management System based on Modified K-Mean Algorithm in Smart Port Services	Ari Wijayanti and Okkie Puspitorini (Politeknik Elektronika Negeri Surabaya, Indonesia); Nur Siswandari, Haniah Mahmudah and Revfath Risqon S. (EEPIS, Indonesia)
104	14.45 - 15.00	1570760423	Characteristics Of Flow Rate On The Performance Of Pico Hydro Turbine System As An Alternative Powerplant	Rusman Rusman and Khairuddin Karim (Politeknik Negeri Samarinda, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Alwathan S.T., M.Si

Track : ES (Engineering Science)

Room : Room XXV

Kode : ES-27

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
105	14.00 - 14.15	1570758969	Guide Application and Digitalization Map of The Mobile-Based Mount Marapi Climbing Route	Yance Sonatha, Ervan Asri, Indri Rahmayuni, Rika Idmayanti, Eka Susanti and Meri Azmi (Politeknik Negeri Padang, Indonesia)
106	14.15 - 14.30	1570759693	Development and Characterization of Jatropha Oil as Innovative Bio-Sourced Phase Change Material for Thermal Energy Storage	I Made Rasta, I Nyoman Suamir, I Wayan Adi Subagia and Ketut Bangse (Bali State Polytechnic, Indonesia); Adi Winarta (Politeknik Negeri Bali, Indonesia); I Gusti Ketut Puja (Sanata Dharma University, Yogyakarta, Indonesia)
107	14.30 - 14.45	1570759006	Covid-19 Spread Prevention System on Campus Based on Student Population Monitoring	Rachmad Imbang Tritjahjono, Noor Basjaruddin and Andriyanto Setyawan (Politeknik Negeri Bandung, Indonesia); Moch Bilal Zaenal Asyikin (National Chin-Yi University of Technology, Taiwan)
108	14.45 - 15.00	1570759064	Design And Implementation Of Zeta Converter Based On PI-ABC Controller As A Battery Charging Control System With Solar Panel	Putu Agus Mahadi Putra (Politeknik Elektronika Negeri Surabaya-Indonesia, Indonesia); Indra Ferdiansyah (Politeknik Elektronika Negeri Surabaya, Indonesia); Mochammad Machmud Rifadil (Electronics Engineering Polytechnic Institute of Surabaya, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Dr. Eng. Hidayat, ST., MT

Track : ES (Engineering Science)

Room : Room XXVI

Kode : ES-28

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
109	14.00 - 14.15	1570759071	Natural Frequencies and Mode Shapes of Human Tympanic Membrane in Myringoplasty	Hidayat Hidayat (Politeknik Negeri Samarinda, Indonesia); Sudarsono Sudarsono (Universitas Halu Oleo, Indonesia); Ruspita Sihombing (Politeknik Negeri Samarinda, Indonesia); Rozaini Othman (Universiti Teknologi MARA, Malaysia); Minir Minir (Politeknik Negeri Samarinda, Indonesia)
110	14.15 - 14.30	1570764348	Investigation on Performance of Solar Collector In The Adsorption Process with Variation of Angle of Surface Plate	Hidayat Hidayat (Politeknik Negeri Samarinda, Indonesia); Sudarsono Sudarsono (Universitas Halu Oleo, Indonesia); Rozaini Othman (Universiti Teknologi MARA, Malaysia); Mangkona Mangkona, Abdul Muis, Darma Aviva and Abdul Halik (Politeknik Negeri Samarinda, Indonesia)
111	14.30 - 14.45	1570748844	Development Of Hydrogen Gas Generator Prototype Model For Vehicle Fuel With Electrolysis Method	Putu Darmawa, I Kadek Ervan Hadi Wiryanta and I Sutarna (Bali State Polytechnic, Indonesia)
112	14.45 - 15.00	1570759081	The portable tools of the elderly alzheimer patients	Yulastri Yulastri, Era Madona, Anggara Nasution and M.Irmansyah (Politeknik Negeri Padang, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Ida Bagus Gede Widianjara

Track : ES (Engineering Science)

Room : Room XXVII

Kode : ES-29

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
113	14.00 - 14.15	1570759100	Application of shell and tube model condenser on alcohol content on Arak distillation equipment	I Made Sudana, I Gede Nyoman Suta Waisnawa and IM Rajendra (Politeknik Negeri Bali, Indonesia)
114	14.15 - 14.30	1570759105	Analysis of Community-based Rural Water Management (PAMDES) in the rural clean water supply system of Jembrana Regency	I Nyoman Anom Purwa Winaya, Mudhina Made and Sedana Triadi I Nyoman (Politeknik Negeri Bali, Indonesia)
115	14.30 - 14.45	1570759146	Driving Factors Online Shopping In The Era Of New Normal	Marike Kondo, Herry Langi and Yoice Putung (Manado State Polytechnic, Indonesia)
116	14.45 - 15.00	1570759192	Measurement of problem difficulty level in user interface medical management system (mms) application with heuristic evaluation approach at surabaya medical services hospital	Amir Ali and Muhadi (Stikes Yayasan Rumah Sakit Soetomo, Indonesia); M.Udin Harun Al Rasyid and Iwan Syarif (Politeknik Elektronika Negeri Surabaya, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Ir. Herawati Budiastuti, Ph.D

Track : ES (Engineering Science)

Room : Room XXVIII

Kode : ES-30

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
117	14.00 - 14.15	1570759216	Evaluation of Power Consumption in Moringa Leaves Dryer	Sumartini Dana, Yohanes Subhan Peli, Ade Gah, Indranata Utama Panggalo, and Indah Laleb (Politeknik Negeri Kupang, Indonesia)
118	14.15 - 14.30	1570759258	Determination of Student Satisfaction Perceptions at Bali State Polytechnic Using the TF-IDF Method with Linear Regression and Logistic Regression Classifier	I Gusti Ngurah Bagus Catur Bawa, I Wayan Suasnawa, Ni Gusti Ayu Putu Harry Saptarini, Anak Agung Ngurah Gde Sapteka, Kadek Amerta Yasa and I Komang Wiratama (Politeknik Negeri Bali, Indonesia)
119	14.30 - 14.45	1570759365	Development Of Population Data Cluster Application Based On Real-Time Expertise	Herry Langi (Manado State Polytechnic, Indonesia); Ottopianus Mellolo (Politeknik Negeri Manado, Indonesia); Doostenreyk Kantohe, Sonny Kasenda and Tracy Marsela (Manado State Polytechnic, Indonesia)
120	14.45 - 15.00	1570759401	The Development of Dance Movement in Humanoid Robot Dancing ERISA	Novian Fajar Satria, Eko Henfri Binugroho, Ridhan Hafizh Chairussy, Dwi Kurnia Basuki and Bianca Surya Nobelia (Politeknik Elektronika Negeri Surabaya, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Yuli Patmawati, ST., M.Eng

Track : ES (Engineering Science)

Room : Room XXIX

Kode : ES-31

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
121	14.00 - 14.15	1570759380	Characteristic of Shelter for Child Pedestrian	Febriane P Makalew and Sherley Runtunuwu (Politeknik Negeri Manado, Indonesia); Steve Supit (Manado State Polytechnic, Indonesia); E Waney and Steve Wilben M.S (Politeknik Negeri Manado, Indonesia)
122	14.15 - 14.30	1570759406	Design and Construction of Gazebo	Febriane P Makalew, Rilya Rumbayan, Helen Mantiri and Deyke Mandang (Politeknik Negeri Manado, Indonesia); Rilya Rumbayan (Manado State Polytechnic, Indonesia)
123	14.30 - 14.45	1570759410	Effect of Type of Activator and Ultrasonic Waves on the Chemical Activation Process on the Characteristics of Activated Charcoal from the Rubber Fruit Shell	Sirajuddin Sirajuddin, Harjanto Polnes and Inzirah Inzirah (Politeknik Negeri Samarinda, Indonesia)
124	14.45 - 15.00	1570759413	Development of Creative Advertisement Console For Squeeze Frame And Running Text	Novita Astin (Electronics Engineering Polytechnic Institute of Surabaya, Indonesia); Nandita Ayundra Wulintang Ceraka (Politeknik Elektronika Negeri Surabaya, Indonesia)

Session II

14.00 - 15.00 WITA

Moderator : Dwi Cahyadi, ST., MT

Track : ES (Engineering Science)

Room : Room XXX**Kode : ES-32**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
125	14.00 - 14.15	1570759453	Fuzzy Logic Control System Implementation On Solar And Gas Energy Dryers	Ismail Ramli Ramli and Denny Cipta (Politeknik Negeri Nunukan, Indonesia)
126	14.15 - 14.30	1570759550	Auto Transfer Switch (ATS) Panel Design Based On Internet of Things (IoT)	M Nur Faizi, Adam Adam and Nirwan Budiyanto (Politeknik Negeri Bengkalis, Indonesia)
127	14.30 - 14.45	1570759583	Image Content Authentic Detection System Using Convolutional Neural Network Method	Komang Ayu Triana Indah (Bali State Of Politechnic, Indonesia); Putu Manik Prihatini and Ida Bagus Putra Manuaba (Politeknik Negeri Bali, Indonesia)
128	14.45 - 15.00	1570759688	A Simple Speed and Torque Meter Using Arduino	Purbhawa I Made and Kadek Amerta Yasa (Bali State Polytechnic, Indonesia); I Ketut Gede Sudiarta and I Gusti Ngurah Agung Dwijaya Saputra (Politeknik Negeri Bali, Indonesia); I Wayan Jondra (Electrical Engineering & Politeknik Negeri Bali, Indonesia)

ENGINEERING SCIENCE

Session III

15.00 - 16.00 WITA

Room: Room XV - XXX

Kode: ES33 – ES48

No. 129 - 185

Session III

15.00 - 16.00 WITA

Moderator : Alexius Leonardo Johanis

Track : ES (Engineering Science)

Room : Room XV

Kode : ES-33

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
129	15.00 - 15.15	1570759619	Development of Distillation Machines Incorporating Refrigeration Distiller for Traditional Drink "Arrack Bali" Production	I Nyoman Suamir, I Made Rasta, I Dewa Made Susila and S Sudirman (Bali State Polytechnic, Indonesia)
130	15.15 - 15.30	1570759624	Investigation on the Potential Application of Grid-Connected PV System for Food Cold Storage	I Nyoman Suamir (Bali State Polytechnic, Indonesia); I Wayan Temaja (Politeknik Negeri Bali, Indonesia); Putu Sastra Negara (Bukit Jimbaran Badung Bali Indonesia, Indonesia); Made Ery Arsana (Bali State Polytechnic, Indonesia)
131	15.30 - 15.45	1570759614	Thermal Performance of Bio-Nano-PCM Based Passive Cooling for Vaccine Carriers	I Nyoman Suamir, I Wayan Adi Subagia and Luh Putu Ike Midiani (Bali State Polytechnic, Indonesia); Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia); I Made Rasta (Bali State Polytechnic, Indonesia)
132	15.45 - 16.00	1570758974	Web Based Registration and Entrance Exam Information System for Islamic Boarding School	Indri Rahmayuni, Cipto Prabowo, Wara Ulan Saputri, Yance Sonatha and Ervan Asri (Politeknik Negeri Padang, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Amy Wadu

Track : ES (Engineering Science)

Room : Room XVI

Kode : ES-34

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
133	15.00 - 15.15	1570759739	Cash Waqf Information System	Praditya Nafiis Muhammad and Diana Fitri (Politeknik Elektronika Negeri Surabaya, Indonesia); M. Udin Harun Al Rasyid (Politeknik Elektronika Negeri Surabaya (PENS), Indonesia); Sritrusta Sukaridhoto (Politeknik Elektronika Negeri Surabaya, Indonesia)
134	15.15 - 15.30	1570759842	Earned Value Concept on Project Delay Due Covid-19 Pandemic	Monika Natalia (Politeknik Negeri Padang, Indonesia)
135	15.30 - 15.45	1570759849	Design and Implementation of Zeta Converter for Solar Charger Using Fuzzy Logic Controller	Anissa Fahira Azis (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia); Indhana Sudiharto (Politeknik Elektronika Negeri Surabaya, Indonesia); Ony Qudsi (Politeknik Elektronika Negeri Surabaya & Institut Teknologi Sepuluh Nopember, Indonesia)
136	15.45 - 16.00	1570759932	Optimization of irrigation water using system of rice intensification (SRI) method in the Kereloko irrigation area West Sumba Regency	Stefen Ndun, Yacob Hayer and Fabianus Nope (Politeknik Negeri Kupang, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Wahyuni Eka Sari, S.Kom., M.Eng

Track : ES (Engineering Science)

Room : Room XVII

Kode : ES-35

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
137	15.00 - 15.15	1570759974	An Improved Hysteresis Band based FCS MPC For Grid Connected Three Phase Inverter	Hendi Purnata, Galih Mustiko Aji, Purwiyanto Purwiyanto and Afrizal Abdi Musyafiq (Politeknik Negeri Cilacap, Indonesia)
138	15.15 - 15.30	1570759980	Design and Development of SHIPS-ROV	Budianto Budianto (Politeknik Perkapalan Negeri Surabaya, Indonesia); Mohammad Basuki Rahmat (Shipbuilding Institute of Polytechnic Surabaya (PPNS), Indonesia); Imam Sutrisno and Zindhu Maulana Ahmad (Politeknik Perkapalan Negeri Surabaya, Indonesia); Eko Julianto (Shipbuilding Institute of Polytechnic Surabaya (PPNS), Indonesia); Arie Indartono (Shipbuilding Institute of Polytechnic Surabaya, Indonesia)
139	15.30 - 15.45	1570759988	Design of Parking Brake Lock - RFID Based Motorbikes Security Module	Muhammad Firdaus Jauhari and Yuan Perdana (Politeknik Negeri Banjarmasin, Indonesia)
140	15.45 - 16.00	1570759994	Decision Support Systems For Employee Performance Assessment	Wahyuni Eka Sari, Darius Shyafary, Dwi Cahyadi and Rony Herman (Politeknik Negeri Samarinda, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Novita Indriani, SS., MA

Track : ES (Engineering Science)

Room : Room XVIII

Kode : ES-36

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
141	15.00 - 15.15	1570760032	Image Distance Measurement With Only Camera Using OpenCV Object Detection	Friendly Friendly, Rahmat Widia Sembiring and Harizahayu H (Politeknik Negeri Medan, Indonesia)
142	15.15 - 15.30	1570760046	The Implementation Of D155A-2 Bulldozer Sterring Overhaul	Al A Amin and Halman Halman (Politeknik Negeri Nunukan, Indonesia)
143	15.30 - 15.45	1570760048	Smart Tourism Village Application on Android Platform (A Case Study: Serangan Tourism Village, Bali - Indonesia)	Sri Andriati Asri, I Nyoman Gede Arya Astawa, I Gusti Agung Made Sunaya and I Made Riyan Adi Nugroho (Politeknik Negeri Bali, Indonesia); Widyadi Setiawan (Udayana University, Indonesia)
144	15.45 - 16.00	1570760078	Implementation of Kalman Filter Method in COVID-19 Patients Monitoring Application Based on Bluetooth Low Energy (BLE)	Chika Vevita Novelia (Politeknik Elektronika Negeri Surabaya, Indonesia); Haniah Mahmudah (EEPIS, Indonesia); Aries Pratiarso (Politeknik Elektronika Negeri Surabaya (PENS), Indonesia); Nur Siswandari (EEPIS, Indonesia); Ari Wijayanti and Okkie Puspitorini (Politeknik Elektronika Negeri Surabaya, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : I Wayan Lanang N., S.ST.Par., M.Par

Track : ES (Engineering Science)

Room : Room XIX

Kode : ES-37

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
145	15.00 - 15.15	1570760079	The Correlation of Lux and Distance to Markerless Augmented Reality Detection Technique for Digital Therapy Application	Maulidya Anggraini (Politeknik Elektronika Negeri Surabaya, Indonesia); Akuwan Saleh (Electronic Engineering Polytechnic Institute of Surabaya, in Indonesia, Indonesia); Haniah Mahmudah (EEPIS, Indonesia); I Gede Puja Astawa (Politeknik Elektronika Negeri Surabaya, Indonesia); Aries Pratiarso (Politeknik Elektronika Negeri Surabaya (PENS), Indonesia); Mochammad Zen Samsono Hadi (Politeknik Elektronika Negeri Surabaya, Indonesia)
146	15.15 - 15.30	1570760080	Enhancement Accuracy of The Spatial Map Matching Algorithm Using Combine Test and Candidate Points in Mobile Application	Erika Vernanda (Politeknik Elektronika Negeri Surabaya, Indonesia); Haniah Mahmudah (EEPIS, Indonesia); Tri Budi Santoso (Electronic Engineering Polytechnic of Surabaya (EEPIS) & Institut Teknologi Sepuluh Nopember (ITS), Indonesia); Okkie Puspitorini (Politeknik Elektronika Negeri Surabaya, Indonesia); Nur Siswandari (EEPIS, Indonesia); Ari Wijayanti (Politeknik Elektronika Negeri Surabaya, Indonesia)
147	15.30 - 15.45	1570760099	The physicochemical characteristic and inhibition zone of Eschericia coli in ketepeng (Cassia alata L.) leaf extract transparent soap	Encik Eko Rifkowaty and Adha Panca Wardanu (Politeknik Negeri Ketapang, Indonesia)
148	15.45 - 16.00	1570760156	An Observation of Soil pH, Temperature and Moisture of Siamese Orange Farm at Kerta Village, Payangan, Gianyar, Bali	Anak Agung Ngurah Gde Saptaka and Anak Agung Ngurah Made Narottama (Politeknik Negeri Bali, Indonesia); Kadek Amerta Yasa (Bali State Polytechnic, Indonesia); I Gusti Agung Gede Wiadnyana (Universitas Mahadewa Indonesia, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Arief Adhiksana, S.ST., MT

Track : ES (Engineering Science)

Room : Room XX**Kode : ES-38**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
149	15.00 - 15.15	1570760180	Exploring Concept Design of User Experience with Diegetic Approach for Cultural Heritage Virtual Reality Exhibition	Cahya Miranto (Politeknik Elektronika Negeri Surabaya & Politeknik Negeri Batam, Indonesia); Hestiasari Rante and Sritrusta Sukaridhoto (Politeknik Elektronika Negeri Surabaya, Indonesia)
150	15.15 - 15.30	1570760181	Optimization of 3D Printing Process Parameters on Tensile Strength of ABS Filament Material Product Using Taguchi Method	Farizi Rachman (Shipbuilding Institute of Polytechnic Surabaya, Indonesia); Bayu Kurniawan and Mega Yoningtias (Politeknik Perkapalan Negeri Surabaya, Indonesia)
151	15.30 - 15.45	1570760200	Smart Controller Design of Solar Home System (SHS) for Load Management With Grid Connected	Mychael Gatriser Pae, Daniel M.D.U Kasse and Ronald Enstein Renoat (Politeknik Negeri Kupang, Indonesia)
152	15.45 - 16.00	1570760202	The Impact of Limited Carbon Emission on Supply Chain and Emission Costs	Thina Ardliana (Polteknik Perkapalan Negeri Surabaya, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Yudi Pranoto, ST., M.Eng

Track : ES (Engineering Science)

Room : Room XX1

Kode : ES-39

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
153	15.00 - 15.15	1570760204	Quantity And Composition Of Liquid Products From Used Motorcycle Tire Pyrolysis	Sitti Sahraeni (Politeknik Negeri Samarinda, Indonesia); Ibnu Rahayu (Polytecnic State of Samarinda, Indonesia); Helda Helda (Politeknik Negeri Samarinda, Indonesia)
154	15.15 - 15.30	1570760210	Numerical Study of Outlet Pressure On The Condensing Flow From Steam Turbine Blade with Blade Spacing Variation	Nauvilah Virganata (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia); Lohdy Diana and Arrad Ghani Safitra (Politeknik Elektronika Negeri Surabaya, Indonesia)
155	15.30 - 15.45	1570760218	Numerical Study The Effect Of Undulation To Mitigate Erosion Elbow	Sultana Mawaddah, Lohdy Diana and Hendrik Elvian Gayuh Prasetya (Politeknik Elektronika Negeri Surabaya, Indonesia)
156	15.45 - 16.00	1570745786	Preliminary Study for Development of Hydro Energy Harvesting In An Open Channel Irrigation System	Ketut Bangse (Bali State Polytechnic, Indonesia); Idg Agustriputra (Bali State Polytechnic & Researcher, Indonesia); S Sudirman, Made Ery Arsana, I Sutarna and I Made Sugina (Bali State Polytechnic, Indonesia); I Nyoman Gede Baliarta (Politeknik Negeri Bali, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Tien Rahayu Tulili, ST., M.Tech

Track : ES (Engineering Science)

Room : Room XXII

Kode : ES-40

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
157	15.00 - 15.15	1570760286	The implementation of the placement of health workers in health centers using k-means clustering method case study in the city of Samarinda	Damar Nurcahyono and Tien Rahayu Tulili (Politeknik Negeri Samarinda, Indonesia)
158	15.15 - 15.30	1570760303	Twitter Sentiment Analysis on the Implementation of Online Learning during the Pandemic Using Naive Bayes and Support Vector Machine	I Wayan Suasnawa, I Gusti Ngurah Bagus Catur Bawa, I Gede Suputra Widharma, Anak Agung Ngurah Gde Sapteka, I Nyoman Eddy Indrayana and I Gusti Agung Made Sunaya (Politeknik Negeri Bali, Indonesia)
159	15.30 - 15.45	1570760312	Thrust Force Analysis in Drilling Wood and Natural Fibre Reinforced Composite	Anggit Murdani and RN Akhsanu Takwim (State Polytechnic of Malang, Indonesia); Muhammad Fakhruddin (State Polytechnic of Malang)
160	15.45 - 16.00	1570760322	Mini Pile Foundation Construction Design on Soft Soil due to Box Traffic Loads based on Standard Penetration Test	Liliwati Liliwati Dwina Archenita and Sandra Faurina (Politeknik Negeri Padang, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Jusuf Wilson Meynerd Rafael

Track : ES (Engineering Science)

Room : Room XXIII**Kode : ES-41**

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
161	15.00 - 15.15	1570760352	Analysis Damage Cylinder Head Engine on QSK 50 MCRS	Hamka Munir Munir and Ismail Ramli (Politeknik Negeri Nunukann, Indonesia)
162	15.15 - 15.30	1570760366	Application of OHS and Green Construction in Denpasar Markets	A A Putri Indrayanti (Bali State Polytechnic, Indonesia); I Made Budiadi and Ni Made Sitya Rani (Politeknik Negeri Bali, Indonesia)
163	15.30 - 15.45	1570760383	Effect of Stainless Steel Duplex Electrode Size on Hydrogen Production through Electrolysis Process	Yohandri Bow, Rusdianasari Rusdianasari and Aneasari Meidinariasty (Politeknik Negeri Sriwijaya, Indonesia); Muhammad Yori Pratama (Institut Teknologi Bandung, Indonesia)
164	15.45 - 16.00	1570760385	Improving The Quality Of Fishery Products By Maintaining Ideal Composition Of Seaweed Caragenan (<i>Kappaphycus alvarezii</i>)	Siti Hajar and Herlina Nawir (Politeknik Negeri Nunukan, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Muh. Irwan, ST., MT., Ph.D

Track : ES (Engineering Science)

Room : Room XXIV

Kode : ES-42

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
165	15.00 - 15.15	1570760409	Activity Test of Temperature Variations in Cracking Process of Palm Oil using Al ₂ O ₃ to Green Diesel Viscosity	Tiara Indah Damayanti, Sofiyan Adi Putra, Faaiz Al Ghifari and Haris Puspito Buwono (Politeknik Negeri Malang, Indonesia)
166	15.15 - 15.30	1570760416	Effect of Different Type Catalyst on Biodiesel Production from Jatropha Curcas Oil via Transesterification using Ultrasonic Assisted	Muh. Irwan, Ramli Ramli, Mardhiyah Nadir, Marlinda Marlinda and Arief Adhiksana (Politeknik Negeri Samarinda, Indonesia)
167	15.30 - 15.45	1570760420	Activity Test of Temperature Variations in Cracking Process of Palm Oil using Ni/Al ₂ O ₃ to Green Diesel Viscosity	Sofiyan Adi Putra, Tiara Indah Damayanti, Faaiz Al Ghifari, and Haris Puspito Buwono (Politeknik Negeri Malang, Indonesia)
168	15.45 - 16.00	1570758965	Comparison of PI, PD, and PID Controller In Hydroponic Plant Nutrient Concentration Control System	Nurmahaludin Nurmahaludin (Politeknik Negeri Banjarmasin, Indonesia); Gunawan Cahyono (Universitas Lambung Mangkurat, Indonesia); Joni Riadi (Politeknik Negeri Banjarmasin, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Alwathan S.T., M.Si

Track : ES (Engineering Science)

Room : Room XXV

Kode : ES-43

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
169	15.00 - 15.15	1570753196	Revealing The Popularity of Indonesian Local Government Mobile Apps in Google Play Store	I Wayan Budi Sentana, I Made Ari Dwi Suta Atmaja and I Nyoman Gede Arya Astawa (Politeknik Negeri Bali, Indonesia)
170	15.15 - 15.30	1570760450	Design of Audio Based Accident and Crime Detection Using Simple Architecture of Neural Network	Afis Asryullah Pratama and Sritrusta Sukaridhoto (Politeknik Elektronika Negeri Surabaya, Indonesia); Mauridhi Hery Purnomo (Institut of Technology Sepuluh Nopember, Indonesia); Achmad Basuki (Politeknik Elektronika Negeri Surabaya, Indonesia); Vita Lystianingrum (Institut Teknologi Sepuluh Nopember, Indonesia); Rizqi Putri Nourma Budiarti (Universitas Nahdlatul Ulama Surabaya, Indonesia)
171	15.30 - 15.45	1570760462	The Utilization Fly Ash As A Material Substitution For Filler In Asphalt Concrete Wearing Coarse (AC-WC) Mixed With Percentage Refusal Density (PRD) Method	Dwina Archenita, Liliwarti and Aqulah (Politeknik Negeri Padang, Indonesia)
172	15.45 - 16.00	1570760467	Cost and Benefits Analysis of Research and Community Services Information System	Maksy Sendiang (Manado State Polytechnic, Indonesia); Jeanelly Rangkang (Politeknik Negeri Manado, Indonesia); Marike Kondo (Manado State Polytechnic, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Dr. Eng. Hidayat, ST., MT

Track : ES (Engineering Science)

Room : Room XXVI

Kode : ES-44

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
173	15.00 - 15.15	1570760498	Synthesis and Characterization of Chitosan/Sodium Alginate Composite Membrane for Direct Methanol Fuel Cell Application	Rifah Amalia, Firmansyah Adi Nugroho and Ivan Susanto (Politeknik Elektronika Negeri Surabaya, Indonesia)
174	15.15 - 15.30	1570762429	Experimental Study of the Effect of Excitation Current on the Output Voltage of a Self-Excited Synchronous Generator	Anggara Trisna Nugraha and Alwy Muhammad Ravi (Politeknik Perkapalan Negeri Surabaya, Indonesia)
175	15.30 - 15.45	1570763297	Combination Method to Determine Shrimp Pond Cultivation Land	Linda Perdana Wanti, Dwi Murni Handayani Abdul Rohman Supriyono, Ratih Hafsarrah Maharrani and Nur Wahyu Rahadi (Politeknik Negeri Cilacap, Indonesia)
176	15.45 - 16.00	1570764430	Optimization of Certainty Factor Method To Detect Preeclampsia in Women Pregnant	Linda Perdana Wanti, Nur Wachid Adi Prasetya and Laura Lina (Politeknik Negeri Cilacap, Indonesia); Lina Puspitasari (STIKES Graha Mandiri, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Ida Bagus Gede Widianjara

Track : ES (Engineering Science)

Room : Room XXVII

Kode : ES-45

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
177	15.00 - 15.15	1570764236	ARIMA Modeling For Prediction of Inorganic Chemical Pollution in the Kalitambong Watershed, Bondowoso Regency	Rizza Wijaya and Budi Hariono (Politeknik Negeri Jember, Indonesia)
178	15.15 - 15.30	1570763393	Realtime Detection Of Masks And Distance In An Effort To Control Physical Distancing Based On Faster R-CNN	Agus Khumaidi (Politeknik Perkapalan Negeri Surabaya, Indonesia); Intan Sari (Politeknik Perkapalan Negeri Surabaya, Indonesia); Joko Endrasmono (Shipbuilding Institute of Polytechnic Surabaya, Indonesia); Ryan Yudha Adhitya (Politeknik Perkapalan Negeri Surabaya, Indonesia)
179	15.30 - 15.45	1570764302	SCADA Dynamic Application Design Equipped With Multi Connections	Agus Khumaidi and Hananta R (Politeknik Perkapalan Negeri Surabaya, Indonesia); Mohammad Basuki Rahmat (Shipbuilding Institute of Polytechnic Surabaya (PPNS), Indonesia); Ryan Yudha Adhitya and Joessianto Eko Poetro (Politeknik Perkapalan Negeri Surabaya, Indonesia); Arie Indartono and P.N.A Nugroho (Shipbuilding Institute of Polytechnic Surabaya, Indonesia)
180	15.45 - 16.00	1570764328	The Influence of Variation of Electrical Current and Electroplating Process Time on Coating Thickness, Glossiness and Adhesion of Copper on Low Carbon Steel	Denny Cipta and Ismail Ramli Ramli (Politeknik Negeri Nunukan, Indonesia)

Session III

15.00 - 16.00 WITA

Moderator : Ir. Herawati Budiastuti, Ph.D

Track : ES (Engineering Science)

Room : Room XXVIII

Kode : ES-46

No.	Time	Paper ID	Paper Title	Authors with affiliation and country
181	15.00 - 15.15	1570748877	Experimental Study of the Effect of Reactor Temperature Reconstruction on Fuel Consumption and Distillate Quantity	Ida Puspa Indra (Bali State Polytechnic, Indonesia); I Made Anom Adiaksa (Politenik Negeri Bali, Indonesia); I Gusti Ngurah Ardana (Politeknik Negeri Bali, Indonesia)
182	15.15 - 15.30	1570764400	Application of The Internship Process and Testing Using The Black box Method	Harson Kapoh, Olga Melo and Roby Lumbu (Politeknik Negeri Manado & Goverment, Indonesia)
183	15.30 - 15.45	1570764416	Management Information System of Student Affair in Manado State Polytechnic	Alfrets Wauran (Manado State Polytechnic, Indonesia); Selvy Kalele (Politeknik Negeri Manado, Indonesia); Willem Pomantow (Manado State Polytechnic, Indonesia)
184	15.45 - 16.00	1570764240	Analysing the Characteristics and Behaviours of Travellers for Developing a Trans Padang New Line	Gusri Yaldi, Imelda Nur and Apwiddhal Apwiddhal (Politeknik Negeri Padang, Indonesia)
185	16.00 - 16.15	1570764431	Decision Support System of Social Assistance in Bitung City by Using AHP Method	Alfrets Wauran (Manado State Polytechnic, Indonesia); Anthon Kimbal (Politeknik Negeri Manado, Indonesia); Roby Lumbu (Manado State Polytechnic, Indonesia)

Effect of Stainless Steel Duplex Electrode Size on Hydrogen Production through Electrolysis Process

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Keywords: Electrode, Duplex Stainless Steel, Hydrogen, Electrolysis.

Abstract: Renewable energy development is the focus of attention at this time, using environmentally friendly energy sources and zero emission by utilizing water to make hydrogen through the electrolysis process. The electrode material is selected from materials that have good electrical conductivity and corrosion resistance. Duplex Stainless Steel (DSS) is a material with a combination of two phases, namely austenite and ferrite. The process includes designing tools, manufacturing, and testing the performance of the electrolyzer against the variation in the cross-sectional area with a voltage of 12V and variations in current and electrolytes used are brackish water with a salinity of 8 ppt. The larger the cross-sectional area, the easier the electron transfer that occurs during the electrolysis process, which causes the charge of electrons to react more, then the resulting current will be more significant, this results in a large amount of power generated, while efficiency is inversely proportional to power. Electrode size is also proportional to the current. Electrode 2 inch is more effective than electrode 1.5 inch because, at current 35 A, an efficiency of 93.33% is obtained with the volume of gas produced is 1.9087 Liters.

1 INTRODUCTION


Electrolysis of water is the decomposition of water compounds (H₂O) into hydrogen gas (H₂) and oxygen (O₂) by using an electric current through water (Ploetz et al., 2016; Rusdianasari et al., 2019). Hydrogen is one of the new renewable energy sources that can reduce exhaust emissions by using water as fuel through the process of electrolysis of water compounds (H₂O) which is converted into its constituent components, namely oxygen and hydrogen (Kassaby et al., 2016; Imperiyka et al., 2017; Irtas et al., 2021; Jannah et al., 2020).


The production of hydrogen gas from seawater containing NaCl can take place quickly because NaCl itself functions as a natural catalyst. The content of the natural catalyst or commonly referred to as salinity, affects the electrolysis process. In the study of electrolysis made from water and seawater based on variations in current and salinity, the salinity used was 0.05 ppt, 15 ppt, and 35 ppt with the best gas conversion at a salinity variation of 35 ppt

(Phalakornkule et al., 2020; Purnamasari et al., 2019; Rusdianasari et al., 2020; Rusdianasari et al., 2020).

The production of H₂ gas by electrolysis of water and seawater obtained the highest concentration of H₂ gas formed, namely the electrolysis of aqua DM, which was added with NaCl and NaOH of 4500 ppm. In this study, the concentration of NaOH catalyst was not varied in the electrolysis process (Imperiyka et al., 2017). The results of another study stated that in the production of hydrogen gas with an H₂SO₄ catalyst, the greater the current and the greater the number of electrodes provided with the same sulfuric acid concentration, the greater the concentration of hydrogen gas produced (Syakdani et al., 2019; Bow et al., 2018; Amelia et al., 2021). The greater the concentration of the catalyst, the greater the precipitate formed during the electrolysis process and causes obstruction of the process of forming gas bubbles at the electrode (Hadi, 2020).

A catalyst is a substance that can accelerate the rate of a chemical reaction which at the end of the reaction is obtained in its original state or does not

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react (Sellami and Loudiyi, 2017). In the electrolysis of water, a catalyst is used to facilitate or accelerate the decomposition of water into hydrogen and oxygen because the catalyst ions are able to affect the stability of water molecules into H^+ and OH^- ions which are easier to electrolyze due to a decrease in activation energy (O'Neil et al., 2016).

Research using stainless steel electrodes produced 95.8 ml and 82.6 ml of HHO gas, respectively. The electrolyte used is KOH and electrodes made of Stainless Steel with variations in the cross-sectional area of the electrode with sizes 9 cm x 11 cm and 9 cm x 14 cm (Meier, 2014).

The most important components of the electrolysis process are electrodes and electrolyte solutions (Irena, 2020). One of the raw materials for electrolysis is water. Electrolysis of water which has the chemical formula H_2O is the event of the decomposition of water compounds (H_2O) into its constituent elements, namely hydrogen (H_2) and oxygen (O_2), by using an electric current. Electrolysis is an event that occurs when an electric current is passed through an ionic compound and the compound undergoes a chemical reaction (Abdel-Aal et al., 2020).

Hydrogen gas as the main product and oxygen produced from the electrolysis of water form bubbles at the electrodes and can be collected in a reservoir. This principle is then used to produce hydrogen that can be used as fuel for hydrogen vehicles. Michael Faraday discovered the electrolysis process in 1820. Factors that affect the electrolysis process include the use of a catalyst, the immersed surface area, the nature of the electrode raw material, the concentration of the reactants, and the amount of external voltage (Moulita et al., 2020).

The main product, hydrogen in the water electrolysis process, is highly flammable and will burn at a concentration of 4% in free air. The enthalpy of combustion of hydrogen gas is -286 kJ/mol (Yunsari et al., 2019). Based on this, safety is needed when burning hydrogen gas. The arrestor is a tool component that reduces the risk of work accidents such as explosions due to flashback fires during the hydrogen gas flame test (Bow et al., 2020). In this study, electrolysis was carried out using a prototype electrolysis reactor equipped with an arrestor in terms of the effect of the size of Duplex Stainless Steel on hydrogen production through the electrolysis process.

2 METHODOLOGY

The material used in this study is water with a salinity of 8 ppt which was taken according to seawater sampling standards (SNI 6964.8:2015). After

knowing the salinity that produces hydrogen gas optimally, variations in the size of the stainless steel duplex electrode are carried out. The seawater electrolysis prototype consists of five main units, namely, feed tank, electrolyzer tube, electrodes, H_2 and O_2 gas cylinders, flashback arrestor, and control panel. The system is equipped with measuring instruments, namely digital pressure detectors, digital temperature detectors, H_2 smart sensors, and O_2 smart sensors. The electrolysis equipment used can be seen in Figure 1.



Figure 1: Electrolyzer Prototype.

The electrolysis process is carried out using the Hydrogen Generator Using Water Electrolysis Process method based on ISO 22734-1:2008 with adjustments to the design and condition of the tool. The electrolysis process in the electrolysis reactor used is that the feed is pumped into the electrolyzer as much as 17 liters. The electrolysis process is carried out with a certain current. The electrolysis results obtained are in the form of hydrogen and oxygen gas in the electrolyzer, which will then be temporarily accommodated in the gas holding tank. During the electrolysis process, data is collected every 2 minutes in the form of operational condition data in the form of pressure, temperature, and voltage. After hydrogen gas is obtained, then temperature data is taken on the arrestor every 2 minutes.

3 RESULT AND DISCUSSION

In this study, we want to get the effect of Duplex Stainless Steel as an electrode and the electrolyte used is brackish water on the production of hydrogen gas produced. The prototype for making hydrogen was carried out by varying the size of the

electrode with the respective electrode diameters (2 inches and 1.5 inches), the thickness was 0.33 mm, and the electrode height was 40 cm, and the current variation with a voltage of 12 Volts for 480 seconds and using an electrolyte, namely water. brackish with a salinity of 8 ppt. The production of hydrogen gas produced by varying the size of the electrodes can be seen in Table 1.

Table 1: Hydrogen production based on electrode cross-sectional area.

Electrode Size	I (A)	V (Volt)	H ₂ Gas Volume (Liter)	P (Watt)	η (%)
Electrode I (D= 2 inch, t= 40cm)	15	11.9	0.8512	178.5	99.17
	20	11.7	1.1251	234	97.50
	25	11.6	1.3877	290	96.67
	30	11.6	1.6538	348	96.67
	35	11.5	1.8719	402.5	95.83
Electrode II (D= 1,5 inch, t=40cm)	15	11.6	0.8539	174	96.67
	20	11.5	1.1407	230	95.83
	25	11.5	1.4179	287.5	95.83
	30	11.3	1.6769	339	94.17
	35	11.2	1.9087	392	93.33

3.1 Effect of Current and Electrode Size on the Volume of Hydrogen Produced

The formation of hydrogen gas in the electrolysis process has a directly proportional relationship between gas yield, time, and current strength. The results of measuring the volume of hydrogen gas produced at different electric currents and the cross-sectional area of the duplex stainless steel electrodes used during the electrolysis process can be seen in Figure 2.

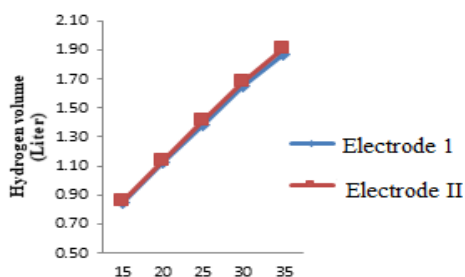


Figure 2: The volume of hydrogen gas produced is based on the current t and the size of the electrode.

Figure 2 shows that the transfer of electrons during electrolysis results in an increase in the production rate of hydrogen gas produced. This is indicated by an increase in current and a different size of the electrode. The size of electrode I (2 inches) is obtained with a current of 35A, the volume of gas produced is 1.8719 liters, while the size of the electrode II (1.5 inches) is that the volume of gas produced is 1.9087 liters. The increase in the volume of gas produced at different electrode sizes is not significant, this occurs because the electrode sizes are 2 inches and 1.5 inches respectively, with the same electrode height. The increase in current and voltage causes the electrolysis process to occur quickly because the movement of the molecules is also increasing. The temperature in this process also increases due to the faster movement of electrons during the electrolysis process (Ploetz, R. Rusdianasari and Eviliana, 2016).

3.2 Effect of Current and Electrode Size on the Electric Power Generated

The relationship between current and power generated by using different sizes of electrodes can be seen in Figure 3.

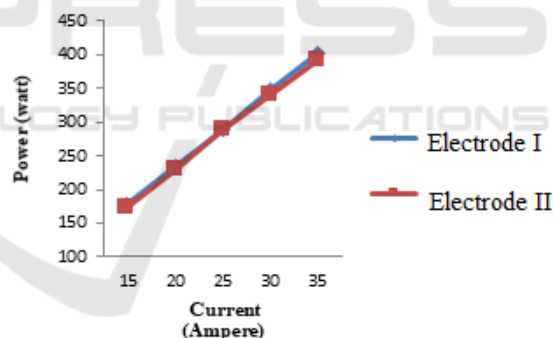


Figure 3: The electric power generated is based on the current and the size of the electrode.

Figure 3 shows that the relationship between the current and the supplied power is less significant for different electrode sizes, this happens because the electrode sizes are 2 inches and 1.5 inches, respectively with the same electrode height. At the size of the electrode I obtained with a current of 35A, the power supplied was 402.5 Watts, while the size of the electrode II obtained a power supply of 392 Watts. However, if the cross-sectional area affects the power supply, the larger the size of the electrode, the easier it will be for the transfer of electrons that occurs during the electrolysis process, causing more electrons to react, so the current generated will be

even greater, this results in a large amount of power being generated directly proportional to the current (Purnamasari, I., Yerizam, M., Hasan, A., Junaidi, R., 2019).

3.3 Electrolyzer Efficiency

The performance of the electrolyzer prototype that converts seawater into hydrogen gas with variations in electric current and different sizes of stainless steel duplex electrodes can be seen in Figure 4.

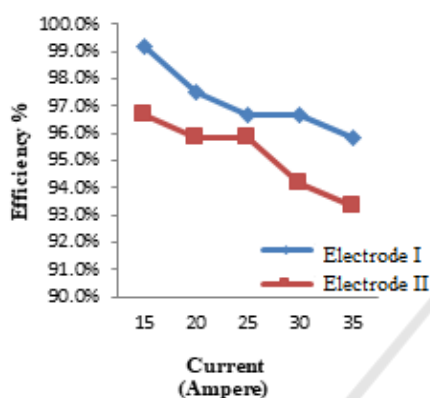


Figure 4: Electrolysis efficiency based on the electrode size.

Figure 4 shows that the greater the electric current, the greater the power produced because power is directly proportional to current, while efficiency is inversely proportional to power. So that the highest efficiency obtained at electrode I is 99.17% with an electrode size of 2 inches at a current of 15A, while the lowest efficiency obtained at electrode II is 93.33% with an electrode size of 1.5 inches at a current of 35A. The relationship between current and efficiency generated, this happens, when an increase in current occurs, the power generated is more significant and the efficiency of the electrolyzer is getting smaller. The efficiency of the electrolyzer is not only affected by the increase in current and power but is also affected by the heat energy produced, which is directly proportional to hydrogen gas. The type of electrode greatly affects the efficiency of the electrolyzer. The electrode used is Duplex Stainless Steel. Besides being able to produce a larger current, this type also reacts and produces a constant and relatively large gas in the long term.

4 CONCLUSIONS

The production of hydrogen has been carried out by the electrolysis method using a prototype electrolyzer

which has an electrolysis cell with a capacity of 15-20 liters. The electrodes used are Duplex Stainless Steel with varying diameter sizes, namely 1.5 inches and 2 inches with a height of 40 cm and an electrode thickness of 0.3 mm. In this process, the highest volume of gas produced with different electrode sizes is found in the size of electrode II (D = 1.5 inches, t = 40cm) at a current of 35A of 1.9087 Liters. The power generated is more significant because the power is directly proportional to the current so that the highest power is obtained at 402.5 Watt with a current of 35A at the electrode size I (D = 2 inches, t = 40cm). The highest efficiency was obtained at the size of the electrode I (D = 2 inches, t = 40cm) with a current of 15A of 99.17%.

ACKNOWLEDGEMENTS

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CERTIFICATE OF PARTICIPANT



This Certificate is Awarded to :

Dr. Yohandri Bow

In recognition of his/her full support and invaluable
service rendered as a

“Presenter”

at the fourth

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