

ISBN :



CONFERENCE PROGRAMS AND ABSTRACT

**ADVANCING SUSTAINABLE SCIENCE AND TECHNOLOGY
THROUGH EFFECTIVE COLLABORATION**

OCTOBER 20-21, 2021

**Palembang, Province of South Sumatera
Indonesia**

Organized By :



FOREWORD FROM GENERAL CHAIR 5th FIRST 2021 INTERNATIONAL CONFERENCE



Assalamu'alaikum wr wb,

Alhamdulillahirrobbil 'alamin, Thank to the God, almighty, due to His bless and love, we are granted good health and opportunity so that we can meet here in the event of the 5th FIRST and the 3rd SNAPTEKMAS 2021.

The honorable keynote speakers of the 5th FIRST and the 3rd SNAPTEKMAS 2021

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti

Prof. Ramaraj Boopathy. from U Alcee Fortier Distinguished Service Professor of Biological Sciences At the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, the Director of State Polytechnic of Sriwijaya.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

For the beginning of my speech, let me welcome all of you with my great warm hug. It is a great honor for me that you choose the 5th FIRST and the 3rd SNAPTEKMAS 2021 as your conference. I am so proud that the authors still become enthusiastic to develop the knowledge although in this pandemic situation. Let us still work hard to support the development of the world through the research, science, and technology in many parts of the knowledge, as what has been purposed by the FIRST conference itself.

In this occasion, I would like proudly to inform you that the 5th FIRST and the 3rd SNAPTEKMAS 2021 as the forum to share knowledge, to search, to find, and to enlarge the link with other industries and universities has attracted so many authors from abroad, such as from: Politeknik Tun Syed Nasir Syed Ismail; MARA University; Politeknik Mukah Sarawak; University Sultan Zainal Abidin, Terengganu, Malaysia; Politeknik Melaka (PMK) Malaysia; Iloilo Science and Technology University (ISAT-U) Philipina; Politeknik Kota Kinabalu; Universiti Teknologi Malaysia; The National University of Malaysia; National Chin-Yi University of Technology (NCUT); Accounting Research Institute UiTM-Malaysia; Management and Science University Malaysia; AlBaha University, KSA, Saudi Arabia; Politeknik Melaka (PMK), Malaysia; Kuantan Community College, Pahang, Malaysia; Universiti Brunei Darussalam; and Ferdowsi University of Mashhad, Iran.

Welcome to all of the researchers that become the collaborators in our research and community service. It is our great honour to have you as our collaborators and participants in the 5th FIRST and the 3rd SNAPTEKMAS 2021.

The honourable keynote speakers, distinguished guests, all participants, ladies and gentlemen,

In this chance, I would like to say thank you very much to the Director of State Polytechnic of Sriwijaya for his full support in the development of the Research and Service Community programs. Due to his hard work and his belief to all of the committee so that this event can be held.

In this occasion, I also would like to convey my big thank to all of the keynote speakers, invited guests, all the participants, all reviewers, and all committee of the 5th FIRST and the 3rd SNAPTEKMAS 2021. Without you all, this event will be nothing. May Allah SWT gives His reward for your sincerity. As the time goes by, it is hoped that our cooperation and coordination in the FIRST and SNAPTEKMAS can be maintained and improved. I hope that you can enjoy this conference and can get a big benefit from this event. I also wish that we can meet again in the forthcoming FISRT ad SNAPTEKMAS

Wassalamu'alaikumwaraahmatullahi wabarakatuh

FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA



The honorable, FIRST 2021 and SNAPTEKMAS 2021 keynote speakers,

Dra. Nana Yuliana, MA., Ph.D., as The Indonesian LBBP Ambassador for the Republic of Cuba, accredited to the Bahamas, Republic of Dominican, Republic of Haiti and Jamaica

Prof. Ramaraj Boopathy., from U Alcee Fortier Distinguished Service Professor of biological sciences at the Nicholls State University, USA

Dr. Ing. Ahmad Taqwa, MT., as Director of Politeknik Negeri Sriwijaya

Assalamualaikum wr wb,

Let us extend our gratitude to Allah SWT, the most gracious, the most merciful. Due to His bless, we can gather here, at the Opening Ceremony of the FIRST 2021 and SNAPTEKMAS 2021

First of all, Please let me deliver my warm welcome to all keynote speakers and all participant of FIRST 2021 and SNAPTEKMAS 2021. It is my great pleasure to meet and see you in this event.

Although, there are so many obstacles that should be faced in the pandemic situation, however, as young generation, we should be optimistic, stay strong and be active in searching and finding the solution. The FIRST 2021 and SNAPTEKMAS 2021 as the DIES of State Polytechnic of Sriwijaya annual event will become one of the media to support those activities. The researchers could share knowledge, find partners, and enlarge the collaboration through this event.

Based on the change in the model of the teaching learning activity that focuses on the MERDEKA BELAJAR, State Polytechnic of Sriwijaya has a big desire in getting acceleration in the internationalization of the institution. One of them by improving the overseas and industrial collaboration, especially in joint research and joint publication. In the beginning of 2021, the research and community service unit in Politeknik Negeri Sriwijaya has launched new schemes of research and community service, namely the Overseas Collaboration Research and Overseas Collaboration Community Service. Thanks to God, those schemes have attracted researchers not only from Asia but also several other countries outside Asia, such as: research and community service collaboration with Al Baha University from Saudi Arabia, with Ferdowsi University of Mashhad from Iran, and with Princess Sumaya University of Technology from Jordan, as well as several other foreign universities.

In this occasion, I also would like to welcome all the researchers that become the collaborators in our new scheme of research and community service. It is our great honour to have you as our collaborators.

The honourable participants,

At this time, State Polytechnic of Sriwijaya has held 5 times of FIRST. FIRST publications from previous conferences have been successfully indexed not only in SCOPUS, but also in WOS. This 5th FIRST seminar will be conjugated with the 3rd National Seminar on Community Service SNAPTEKMAS. (National seminar of applied technology for public). All of these are the efforts to improve the quality of Polsri lecturers which significantly have a positive effect on the learning process of Polsri students.

Before ending my speech, I would like to congratulate the participants of The FIRST 2021 and SNAPTEKMAS 2021. May the noble efforts, support, and cooperation of researchers in this conference will continue. Special thanks to the organizer and co-organizer committee of The FIRST 2021 and SNAPTEKMAS 2021 for the hard work and the commitment in realizing this conference. Do maintain the spirit of working in a team and continue to unite in order to display a culture of excellence in the eyes of the country and the world.

With Bismillahirrahmanirrahim, I officiate The FIRST 2021 and SNAPTEKMAS 2021.
Wassalamu'alaikum warrahmatullahi Wabarakatu

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KEYNOTE SPEAKER



Dra. Nana Yuliana, MA., Ph.D.

The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti

Her Excellency Ambassador Nana Yuliana, Ph.D arrived in Havana, Cuba on December, 23rd, 2020 to serve her duties as the Ambassador Extraordinary and Plenipotentiary of the Republic of Indonesia to Republic of Cuba, Commonwealth of Bahamas, Dominican Republic, Republic of Haiti and Jamaica. She was appointed by the President of the Republic of Indonesia on October 19th, 2020. Prior to her position as Ambassador Extraordinary and Plenipotentiary, she was Consul General of the Republic of Indonesia in Houston, Texas, United States of America from 2017 –2020, after she was the Director of Mid-Career Diplomatic School at the Ministry of Foreign Affairs of Indonesia from 2014 – 2017. Her first diplomatic assignment was as First Secretary of Political Affairs at the Embassy of Indonesia in Manila from 2001-2005. From 2008 to 2012, she was the Counsellor of Economic Affairs of the Embassy of Indonesia in Bangkok and Permanent Representative of Indonesia to the United Nations Economic and Social Commission for Asia and Pacific (UNESCAP). She attended several meetings related to Millennium Development Goals (MDGs) or Sustainable Development Goals (SDGs) issues. Her bachelor's degree was English Education from Institute of Teacher's Training in Jakarta, then she pursued her Master Degree in Applied Linguistics for Macquarie University in Sydney, Australia and also International Relations from University of Indonesia in Jakarta, Indonesia. She completed her Doctoral Degree in Development Studies from the University of Santo Tomas, Manila, Philippines in 2006. While serving as a diplomat since 1995, her passion in teaching and learning encourages her as well to share her knowledge and teaches at the University in Jakarta, Indonesia. During her tenure as Consul General, she was very active in promoting Trade, Tourism, Inbound and Outbound Investments and very keen to engage with Universities for cooperation in human capital development.

KEYNOTE SPEAKER



Prof. Ramaraj Boopathy

Alcee Fortier Distinguished Service Professor of biological sciences
at the Nicholls State University, USA

Fulbright Scholar Fulbright Senior Specialist World Class Professor-Government of Indonesia. Honorary Visiting Professor, ITB, Indonesia Alcee Fortier Distinguished Service Professor John Brady Endowed Professor in Biological Sciences Nicholls State University Business Address: Alcee Fortier Distinguished Service Professor John Brady Endowed Professor in Biological Sciences Department of Biological Sciences Nicholls State University Thibodaux **EDUCATION:** B.Sc. Zoology, University of Madras, India; 1979 M.Sc. Environmental Biology, Tamil Nadu Agricultural University, India; 1981 Ph.D. Environmental Biology, University of Madras, India; 1986 **UNIVERSITY RESPONSIBILITIES:** Responsibilities include Teaching Environmental Biotechnology, a Senior and Graduate level course, Marine and Environmental Biology (Graduate Course), Microbiology and Environmental Biology courses. Research interests include Bioremediation of Hazardous Chemicals and Anaerobic Microbiology. Service includes advising students, participate in Departmental and University committees and serving the local and regional communities. Advisor to Masters Program in Marine and Environmental Biology. **PROFESSIONAL EXPERIENCE:** January 2013 – Present: John Brady Endowed Professor in Biological Sciences, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. August 2012 – Present: Alcee Fortier Distinguished Service Professor, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. August 2004 – Present: Distinguished Service Professor, Department of Biological Sciences, Nicholls State University, Thibodaux. Teaching, Research, and Service to the University and Community. **MAJOR AREAS OF RESEARCH INTERESTS:** Anaerobic digestion, Composting, Biodegradation of hazardous chemicals. Antibiotic resistant bacteria and Antibiotic resistance genes in the aquatic ecosystem. Isolation and identification of novel bacteria. Anaerobic degradation of explosive chemicals with particular reference to sulfate reducing bacteria. Design and development of biological reactor systems. Microbial immobilization of

heavy metals and radionuclides. Alcohol production from agricultural residues. Water quality in the wetlands. Alternative to sugarcane burning, Biological control of termites. Organic ways to control land loss and coastal restoration.

KEYNOTE SPEAKER



Dr. Ing. Ahmad Taqwa, MT.

Director of Politeknik Negeri Sriwijaya Indonesia


Director of State Polytechnic of Sriwijaya, other than that, he is still active at Head of The Research and Publication Commission Forum Director of State Polytechnical In Indonesia, Founder of The Online Journalist Board (IWO) Sumsel, Chairman of The Advisory Board of UKM Nusantara Palembang and Assessor of Higher Accreditation Board. **EDUCATION:** Diplom Ingenieur Electrical Engineering HTL, Ingenieurschule Beider Basel, Switzerland; 1994, Magister (2005) and Doctoral (2010) at Electrical Engineering, Bandung Institute of Technology, Indonesia. **RESEARCH:** Head of Research Assignment “Mini PLTS Periodic Cooling System to Overcome Overheating in Palembang City” (2019), Member of The Research Assignment “Effects of Sea Salt Dust Collection on Output Loss and Solar Panel Output Efficiency” (2020), and Head of Research Assignment “Design and Build of Wireless Sensor Network Prototype Detection Of Landslides Based on IOT and LORA” (2020). **DEDICATION:** “The Design and Evaluation of Virus Scan in The E-Mail System in SMA N 5 Palembang” (2018), Assignment Service “Utilization of WSN Technology in Parking Air Monitoring Foundation SMP Harapan Mulia Palembang” (2019), Development of Teaching Materials with Interactive Multimedia with Education Game for Harapan Mulia Junior High School Students” (2020). **AWARD:** Certificate In Participating In The 200 Hour Advanced Technical Teacher Training awarded by FONTYS and PEDC (1998), Satyalancana Karya Satya X Year 2011 And Satyalancana Karya Satya XX Year 2017 by The President of The Republic of Indonesia. **WORKSHOP:** Seminar and Focus Group Discussion Forum The Rector of Indonesia “Economic Stability In The Vuca Area”, Ujung Pandang (2020), Workshop on Using Integrated Resources Information System Applications For Lecturers of State Polytechnical Polytechnic, Palembang (2019) And Workshop of Learning Methodology of Polsri Lecturers and Outside Education Domicile (PDD) as a Source Person, Palembang (2019).

RUNDOWN
The 5th FIRST 2021 INTERNATIONAL CONFERENCE
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY)
SNAPTEKMAS (Seminar Nasional Aplikasi Teknologi pada Masyarakat) 2021
Palembang, South Sumatera, Indonesia
Thursday, October 21, 20201

		Thursday, October 21, 20201		
No.	Session	Person in Charge	Time Allotment (WIB)	Liaison Officer
1.	Registration	Event Section Committee	07.00 – 08.00	Doeslohal Djumrianti, S.E.MIS., Ph.D
2.	The Opening Ceremony			
3.	Do'a			
4.	Indonesian National Anthem			
5.	Chair Report Speech			
6.	Speech and Opening Remarks by Director of State Polytechnic of Srijijaya	Event Section Committee	08.00 – 09.00	
7.	Souvenirs Gift, Group Photos			
PLENARY SESSION				
No.	Keynote Speaker	Affiliation	Time Allotment (WIB)	Moderator
1.	Dra. Nana Yuliana, MA., Ph.D.	The Indonesian LBBP Ambassador for the Republic of Cuba, concurrently with the Commonwealth of the Bahamas, Jamaica, the Dominican Republic and Haiti	09.00 – 10.00	Tiur Simanjuntak M.Pd.
2.	Prof. Ramaraj Boopathy	Alcee Fortier Distinguished Service Professor of biological sciences at the Nicholls State University, USA	10.00 – 11.00	Prof. Hasan Basri
3..	Dr. Ing. Ahmad Taqwa, MT.	Director of Politeknik Negeri Srijijaya, Indonesia	11.00 – 12.00	Jaksen M. Amin, M.Si.
				Doeslohal Djumrianti, S.E.MIS., Ph.D
				Dr. Nyayu Latifah Husni, M.T.
				Dr. Martha Aznury, S.Pd., M.Si.

PARALLEL SESSION

No.	Theme	Room	Time	Moderator	Articles
1.	TRACK 1 (Engineering and Science)	1	13.00 – 16.00	Dr. Eng Tresna Dewi, M.Eng./ Ika Sulianti, ST, MT	15
2.	TRACK 1 (Engineering and Science)	2	13.00 – 16.00	Dr. Martha Aznury, M.Si./ Indah Purnamasari, M.Eng.	14
3.	TRACK 1 (Engineering and Science)	3	13.00 – 16.00	Fatahul Arifin, M.Eng, Ph.d./ Dr. Indrayani, S.T., M.T.	13
4.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	4	13.00 – 16.00	Rika Sadariawati, M.Si./ M.Miftakul Amin, S.Kom., M.Eng	13
5.	TRACK 2 (Computer Science, Computer Engineering, Information System, Informatics Management)	5	13.00 – 16.00	Dr. Nyayu Latifah H, MT./ Lindawati, S.T., M.TI	12
6.	TRACK 3 (Social Science)	6	13.00 – 16.00	Doeslohah Djumrianti, S.E.MIS., Ph.D/ Dr. Marieska Lupikawati	13
7.	TRACK 3 (Social Science)	7	13.00 – 16.00	Dr. Sari Lestari ZR/ Dr. Rita Martini	14
8.	SNAPTEKMAS 1	8	13.00 – 16.00	Yumi Oklarina, ST, MT/ Mouland Irwadi, SE. M.Si.	15
9.	SNAPTEKMAS 2	9	13.00 – 16.00	Leni Novianti, M.Kom./ Maivi Kusnandar, M.Kom	15
10	SNAPTEKMAS 3	10	13.00 – 16.00	M Husni Mubarak, M.Si./ Martinus Mujur, ST, MT	15
11	SNAPTEKMAS 4	10	13.00 – 16.00	Dr. Ade Silvia H, MT./ M. Sopian Soim, ST, MT	13



CLOSING SESSION

Event	Time	Room
<ul style="list-style-type: none">- Closing Ceremony- Announcement of:<ol style="list-style-type: none">1. Best Paper FIRST IC 20212. Best Paper SNAPTEKMAS 20213. Best Presenter FIRST IC 20214. Best Presenter SNAPTEKMAS 2021- Quiz Online	16.00– 17.00	Main Room

TRACK 3 (Social Science)

ROOM : 6
 TIME : Thursday, 21 October, 2021/ 13.00 - 16.30
 ARTICLES : 13
 MODERATOR : Doeslohal Djumrianti, S.E.MIS., Ph.D/ Dr. Marieska Lupikawati

NO	Time	ID	AUTHORS	TITLE	AFFILIATION
1	13.00-13.10	3847	Ayu Chotibah, Bainil Yulina, Desi Apriyanty, Evada Dewata, Pridson Mandiangan	THE INNOVATION OF SOUTH SUMATERA TRADITIONAL BATIK E-COMMERCE APPLICATIONS	State Polytechnic of Sriwijaya
2	13.10-13.20	3683	M. Thoyib, Riza Wahyudi, Firmansyah, Darul Amri	THE ANALYSIS OF COST QUALITY ON PRODUCTIVITY OF IRON RAILING PRODUCTS IN SMALL AND MEDIUM BUSINESS IN PALEMBANG	State Polytechnic of Sriwijaya
3	13.20-13.30	3757/3756	Nelly Masnila, Firmansyah, Jovan Febriantoko, Riana Mayasari, Jamaliah Said	Quality of Financial Reporting and Impact of GGG Implementation: Study on Local Government in Indonesia	State Polytechnic of Sriwijaya
4	13.30-13.40	3796	Evi Agustina Sari, Sri Gustiani, Yusri, Tiur Simanjuntak	An Error Analysis of English Sentence Construction in Writing Subject Made by the Students of the English Department at Sriwijaya State Polytechnics	State Polytechnic of Sriwijaya
5	13.40-13.50	3827	Edwin Frymaruwah, Farah Aida Ahmad Nadzri, Periansya, Evada Dewata	DISCLOSURE OF SUSTAINABLE PERFORMANCE IN HIGHER EDUCATION IN INDONESIA	State Polytechnic of Sriwijaya, UiTM
6	13.50-14.00	3976	Hendra Hadiwijaya Febrianty Rezanía Agramanisti Azdy	Improvement of LPKA Class 1 Palembang Electronic Dashboard with Field Performance Monitoring	Palcomtech Polytechnic, STMIK PalComTech
7	14.00-14.10	3853/4034	Neneng Miskiyah, Purwati, Yulia Pebrianti, Keti Purnamasari, Nyimas Miftahul Jannah,	OPTIMIZATION OF INCOME PARAMETERS OF SONGKET CRAFTSMEN ON KOPERASI SONGKET PALEMBANG	State Polytechnic of Sriwijaya

Table of Contents

FOREWORD FROM GENERAL CHAIR 5 th FIRST 2021	2
INTERNATIONAL CONFERENCE	2
FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA	4
ORGANIZING COMMITTEE	5
KEYNOTE SPEAKER	7
Dra. Nana Yuliana, MA., Ph.D.	7
KEYNOTE SPEAKER	8
Prof. Ramaraj Boopathy	8
KEYNOTE SPEAKER	10
Dr. Ing. Ahmad Taqwa, MT.	10
RUNDOWN.....	11
The 5 th FIRST 2021 INTERNATIONAL CONFERENCE.....	11
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY).....	11
SNAPTEKMAS (Seminar Nasional Aplikasi Teknologi pada Masyarakat) 2021	11
TRACK 1	14
(Engineering and Science)	14
TRACK 1	17
(Engineering and Science)	17
TRACK 1	20
(Engineering and Science)	20
TRACK 2	23
(Computer Science, Computer Engineering, Information System,.....	23
Informatics Management)	23
TRACK 2	25
(Computer Science, Computer Engineering, Information System,.....	25
Informatics Management)	25
TRACK 3 (Social Science).....	27
TRACK 3 (Social Science).....	29
MODELING OF INFILTRATION WELLS TO REDUCE RAINWATER RUNOFF OF BUILDINGS.....	53
ID: 3772.....	53
Radius Pranoto ^{1*} , Anggi Nidya S ¹ , Ricky RA ¹ , Djaka Suhirkam ¹ , Viktor Suryan ²	53

¹ Civil Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	53
² Civil Department, Palembang Aviation Polytechnic, Palembang 30139, Indonesia.....	53
FLEXURAL STRENGTH OF SELF-COMPACTING CONCRETE BEAMS.....	54
ID: 3860.....	54
Amiruddin ¹ , Ibrahim ¹ , Ika Sulianti ¹ , Agus Subrianto ^{1,*} , Muhamad Ramadhan ¹	54
¹ Polytechnic State of Sriwijaya,	54
THE EFFECT OF SHELL AS A SUBSTITUTION OF COARD AGGREGATE WITH SUPERPLASTICIZER ADDITIONAL ON THE COMPRESSION STRENGTH OF CONCRETE.....	55
ID: 4026.....	55
Lina Flaviana Tilik ^{1,*} Bambang Hidayat Fuady ² , Suhadi ³ , Rosy Armaini ⁴ , Fadhila Firdausa ⁵ , Muhammad Rifqi Agusri ⁶ , Puji Hartoyo ⁷	55
^{1,2,3,4,5,6,7} State Polytechnic of Sriwijaya.....	55
DESIGN OF GEOMETRIC AND RIGID PAVEMENT THICKNESS ON JALAN LINGKAR BARAT SP. SPORTS CENTER - BUKIT SULAP STA 0+100 - STA 7+583 LUBUKLINGGAU CITY, SOUTH SUMATERA PROVINCE.....	56
ID: 3935.....	56
Kosim ¹ , Julian Fikri ^{1*} , siswa Indra ¹ , Kiki Rizky Amalia ¹ , Intan Puspita Sari ² , Yudha Prasetya ²	56
¹ Lecturer of Civil Engineering State Polytechnis Of Sriwijaya.....	56
² Student of Prodi D-1V Road and Bridge Civil Engineering	56
UTILIZATION OF BOTTOM ASH AND SAWDUST WASTE AS A PARTIAL REPLACEMENT FOR FINE AGGREGATE IN THE MANUFACTURE OF CONCRETE.....	57
ID: 3907.....	57
Kosim, Zainuddin ¹ , Raja Marpaung ¹ , Darma Prabudi ¹	57
¹ Department of Civil Engineering Polytechnic State of Sriwijaya.....	57
STUDY ON THE APPLICATION OF BICYCLE SPECIAL ROUTES AS AN ENVIRONMENTAL TRANSPORTATION IN THE CITY AREA OF PALEMBANG USING THE BLOS METHOD	58
ID: 3682.....	58
Efrilia Rahmadona ^{1,*} Norca Praditya ² M. Ade Surya Pratama ³ Sudarmadji ⁴ , Muhammad Iqbal ⁵ ,Arief Perdana Kesuma ⁶ , Rica Solenne ⁷	58
^{1,2,3,4,5,6,7} State Polytechnic of Srwiwijaya	58
UTILIZATION OF REMOTE SENSING TECHNOLOGY FOR FLOOD DISTRIBUTION IN PALEMBANG CITY WEB-BASED	59
ID: 3854.....	59
Indrayani ^{1,*} Andi Herius ¹ , Akhmad Mirza ¹ , Arfan Hasan ¹	59

1 Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia.....	59
UTILIZATION OF THE KELEKAR RIVER FLOW AS MICRO-HYDRO POWER PLANT	60
ID: 3992.....	60
Indrayani ^{1,2*} Aida Syarif ^{2,3} , Syahirman Yusi ^{2,4} , M. Noviansyah Nugraha ² , Renny Citra Ramadhani ²	60
¹ Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia;.....	60
² Renewable Energy Engineering Study Program, Politeknik Negeri Sriwijaya, Palembang Indonesia;.....	60
³ Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia;	60
⁴ Commercial Administration Department, Politeknik Negeri Sriwijaya, Palembang Indonesia	60
IMAGE PROCESSING APPLICATION ON AUTOMATIC FRUIT DETECTION FOR AGRICULTURE INDUSTRY	61
ID: 3804.....	61
Tresna Dewi ^{1,*} Rusdianasari ² RD Kusumanto ³ Siproni ⁴	61
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	61
² Renewable Energy Department, Politeknik Negeri Sriwijaya	61
³ Electrical Engineering Department, Politeknik Negeri Sriwijaya	61
⁴ Mechanical Engineering Department, Politeknik Negeri Sriwijaya	61
THE CONCEPT AND DESIGN OF SOLAR POWERED SPRINKLER SYSTEM BASED ON IOT MONITORING	62
ID: 3880.....	62
Tresna Dewi ^{1,*} Rusdianasari ² Ahmad Taqwa ³ Teddy Wijaya ⁴	62
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	62
² Renewable Energy Department, Politeknik Negeri Sriwijaya	62
³ Renewable Energy Department, Politeknik Negeri Sriwijaya	62
⁴ Electrical Engineering Department, Politeknik Negeri Sriwijaya	62
RAPID TRANSIT (BRT) PUBLIC TRANSPORT SERVICE CORRIDOR I: ALANG LEBAR TO DEMPO DURING THE COVID 19 PANDEMIC IN THE CITY OF PALEMBANG	63
ID: 3837.....	63
Herlinawati ¹ , Yusri Bermawi ^{1,*} , Moch. Absor ¹ , A.Latif ¹ , Muhammad Dimas ¹ , Muhammad Arief M ¹ , Muhammad Geraeldy ¹ , Ibnusyah Alam ¹	63
¹ Civil Engineering, Politeknik Negeri Sriwijaya, Palembang, 30154, Indonesia	63
The Effect of Quenching Media on the Hardness of AISI 1045 Steel.....	64
ID: 4074.....	64
Mulyadi ¹⁾ , Dodi Tafrant ^{1,*)} , Hendradinata ¹⁾ , Zainuddin ¹⁾	64
¹ Mechanical Engineering, State Polytechnic of Sriwijaya.....	64

Improvement of Original Soil with Addition of Variation of Embankment Based on CBR (California Bearing Ratio) Value	65
ID 4107.....	65
Ibrahim ¹ , Andi Herius ¹ , Nadra Mutiara Sari ¹ , M Aidil Iskandarsyah ² , M Okta Fathur Rahman ²	65
¹ Lecturer of Civil Engineering Sriwijaya State Polytechnic.....	65
² Student of D-III Civil Engineering Study Program Sriwijaya State Polytechnic.....	65
Narrative Review of Subchondral Bone Morphology on Cartilage Damage (Osteoarthritis)	66
ID: 4122.....	66
Nanda Yusril Mahendra ¹ , Dicky Pratama Putra ¹ , Imam Akbar ¹ , Risky Utama Putra ¹ , Akbar Teguh Prakoso ¹ , Muhammad Yanis ¹ , Hendri Chandra ¹ , Ardiyansyah Syahrom ^{2,3} , Hasan Basri ^{1*}	66
¹ Department of Mechanical Engineering, Faculty of Engineering, Universitas Sriwijaya, Indralaya, Ogan Ilir, Indonesia.....	66
² Applied Mechanics and Design, School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia 81310 UTM Johor Bahru, Malaysia.....	66
³ Medical Devices and Technology Centre (MEDiTEC), Institute of Human Centred and Engineering (iHumEn), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia	66
Numerical Investigation of the Mechanical Properties of 3D Printed PLA Scaffold	67
ID: 4124.....	67
Zainal Abidin ¹ , Irfan Ghani Fadhlurrahman ¹ , Imam Akbar ¹ , Risky Utama Putra ¹ , Akbar Teguh Prakoso ¹ , M. Zahri Kadir ¹ , Astuti ¹ , Ardiyansyah Syahrom ^{2,3} , Hasan Basri ^{1*}	67
¹ Department of Mechanical Engineering, Faculty of Engineering, Universitas Sriwijaya, Indralaya, Ogan Ilir, Indonesia.....	67
² Applied Mechanics and Design, School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia 81310 UTM Johor Bahru, Malaysia.....	67
³ Medical Devices and Technology Centre (MEDiTEC), Institute of Human Centred and Engineering (iHumEn), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia	67
MODELING OF THREE PHASE INDUCTION MOTORS IN CONTROL SYSTEM LABORATORY AT THE ELECTRICAL DEPARTMENT OF STATE POLYTECHNIC OF SRIWIJAYA	68
ID: 4135.....	68
Masayu Anisah ^{1,*} , Destra Andika Pratama, Niksen Alfari ³ , Lindawati ⁴ , Anton Firmansyah ⁵ , Mery Aldah Regiani ⁶ , Sinta Nabila ⁷ , Safaa Najah Saud ⁸	68
^{1,2,3,4,5,6,7} Politeknik Negeri Sriwijaya, Jl. Sriwijaya Negara - Kota Palembang, 30139.....	68
⁸ Management and Science University, University Drive, Off Persiaran Olahraga, 40100 Shah Alam, Selangor, Malaysia	68
DEGRADATION OF METHYLENE BLUE DYE USING ZnO/NiFe ₂ O ₄ PHOTOCATALYST UNDER VISIBLE LIGHT ...	69

ID: 3967.....	69
Yuniar ^{1*} , Tri Mawarni ² , Poedji Loekitowati Hariani ³ , Muhammad Faizal ⁴ , Tuty Emilia Agustina ⁵	69
^{1,4,5} Chemical Engineering Department, Sriwijaya University, Palembang, Indonesia	69
³ Chemistry Department, Sriwijaya University, Palembang, Indonesia.....	69
² Chemical Engineering Department, State Polytechnic Sriwijaya, Palembang, Indonesia.....	69
SYNGAS ANALYSIS OF LOWRANK COAL GASIFICATION DOWNDRAFT PRODUCTS WITH VARIATIONS IN AIR FLOW RATE.....	70
ID: 3985.....	70
Aida Syarif ¹⁾ , Neli Masnila ²⁾ , Indrayani ³⁾ , M. Yerizam ⁴⁾ , Apriansyah Zulatama ⁵⁾ , Sarmidi ⁶⁾	70
¹⁾ Program Studi Magister Terapan Teknik Energi Terbarukan, Politeknik Negeri Sriwijaya.....	70
²⁾ Program Studi Sarjana Terapan Akutansi Bisnis, Politeknik Negeri Sriwijaya.....	70
³⁾ Program Studi Magister Terapan Teknik energy Terbarukan, Politeknik Negeri Sriwijaya.....	70
⁴⁾ Program Studi Magister Terapan Teknik energy Terbarukan, Politeknik Negeri Sriwijaya.....	70
PRACTICAL LEARNING BASED ON VIRTUAL REALITY METHODS AS A SOLUTION TO INCREASE EVALUATION LEVEL 1 RESULTS IN PRACTICAL LEARNING AT PT PLN (PERSERO) UPDL PALEMBANG.....	71
ID: 3764.....	71
Fajrie Agus Dwino Putra ^{1*} , Supli Efendi Rahim ² , Zulhipni Reno Saputra ³	71
¹ Instructor, PT PLN (Persero) UPDL Palembang, Palembang, Indonesia	71
² Lecturer, Kader Bangsa University, Palembang, Indonesia.....	71
³ Lecturer, Muhammadiyah University, Palembang, Indonesia	71
WITH THE TRAY DYER DRYING METHOD FOR MAKING HERBAL TEA FROM A MIXED FLOWER POLE (Clitoria ternatea) WITH GINGER POWDER (Zingiber officinale) ACCORDING TO INDONESIAN NATIONAL STANDARDS (SNI)	72
ID: 3931.....	72
Sofiah ^{1*} ,A.Rizal Aswan ¹ , Isnandar Yulianto ¹ , Cindi Ramayanti ¹ , Aliyah Nahda Utami ¹	72
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya	72
PROTOTYPE OF KEMPELANG FISH DRYERS REVIEWED FROM ENERGY OF H₂O THAT IS EVAPORATED TO AIR	73
ID: 3782.....	73
Ida Febriana ^{1*} , KA Ridwan ¹ , Aneasari M ¹ , Taufik Jauhari ¹	73
¹ Chemical Engineering Department, State Polytechnic of Sriwijaya, Indonesia	73
ANALYSIS OF SYNGAS RESULTS OF THE MAINDEPTH COAL GASIFICATION PROCESS WITH GASIFICATION DOWNDRAFT METHODS.....	74

ID: 4054.....	74
Erlinawati ¹ , Aida Syarif ² , Arizal Azwan ³ , Tahdid ⁴ ,	74
^{1,2,3,4} Energy Engineering Applied Undergraduate , Sriwijaya State Polytechnic.....	74
DESIGN AND PERFORMANCE OF SMALL-SCALE DOWNDRAFT BIOMASS GASIFICATION: A CASE STUDY OF	75
RICE HUSKS	
ID: 3999.....	75
Ozkar F. Homzah ^{1*} , Rachmat D Sampurno, A Junaidi ¹ , Dodi Tafrant ¹	75
¹ Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	75
.....	76
THE POTENTIAL OF CHAR COAL GASIFICATION AS AN ECO-FRIENDLY FUEL	
ID: 4016.....	76
Aria Yopianita ^{1*} , Aida Syarif ² , Muhammad Yerizam ²	76
¹ Master of Applied Renewable Energy Engineering, Sriwijaya State Polytechnic.....	76
² Chemical Engineering, Sriwijaya State Polytechnic	76
EFFECT OF SULFURIC ACID AND FERMENTATION TIME ON BIOETHANOL PRODUCTION FROM EMPTY FRUIT	77
BUNCH (EFB)	
ID: 3900.....	77
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Siti Chodijah ¹ Felisia Hanura ¹ Muhammad Albarr Akxa ¹ Nova Rachmadona ²	77
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	77
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan...	77
UTILIZATION OF PALM KERNEL OIL (PKO) AS VEGETABLE OIL IN MAKING MAYONNAISE WITH THE ADDITION	78
OF VIRGIN COCONUT OIL (VCO) AND PALM COOKING OIL (PCO)	
ID: 4041.....	78
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Siti Chodijah ¹ M.Arif Abdul Ghoni ¹ Rizka Yuni Zhafira ¹ Nova Rachmadona ²	78
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	78
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan...	78

PRODUCTION OF SOLID SOAP WITH ADDITION OF GREEN BETAL LEAVE (Piper betle L.) EXTRACT AND LEFT LEMON EXTRACT(Cymbopogon nardus L. Rendle) AS ANTIOXIDANTS	79
ID: 4042	79
*Martha Aznury ¹ Ahmad Zikri ¹ Aisyah Suci Ningsih ¹ Elina Margaretty ¹ Liona Agriani ¹ Indriani ¹ Nova Rachmadona ²	79
¹ Department of Chemical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia	79
² Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan	79
PURIFICATION OF RAW MATERIAL AND BIODIESEL PRODUCTS FROM WASTE OIL WITH DEEP EUTETIC SOLVENT (DES)	80
ID: 4043	80
Sahrul Effensi ¹⁾ ,Aida syarif ²⁾ , Irawan ³⁾	80
1,2,3Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Ilir Barat I, Palembang 30139, South Sumatera, Indonesi	80
FIELD EXPERIMENTAL STUDY ON ELECTRICAL POWER GENERATION USING AC SINGLE-PHASE PERMANENT MAGNET GENERATOR	81
ID 4118	81
I Made Wiwit Kastawan ^{1*} , Erwin Yusuf ² , Rusmana ³ , Krisna ⁴	81
SIMULATION ON EFFECTS OF USING CAPACITOR FOR REACTIVE POWER (VAR) COMPENSATION ON ELECTRICAL POWER SUPPLY QUALITY	82
ID 4119	82
Siti Saodah ¹ , I Made Wiwit Kastawan ^{2*} , Erwin Yusuf ³ , Bambang Puguh Manunggal ^{4.} , Maryanti ⁵	82
Biodiesel from Pyrolysis Fatty Acid Methyl Ester (FAME) using Fly Ash as a Catalyst	83
ID: 4066	83
Yohandri Bow ^{1.*} Abu Hasan ² , Rusdianasari ² , Zakaria ³ , Bambang Irawan ² , Nedia Sandika ²	83
¹ Energy Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
² Renewable Energy Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
³ English Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	83
MODELING OF VARIABLE SPEED DRIVE IN THE CONTROL SYSTEM LABORATORY AT THE ELECTRICAL DEPARTMENT OF STATE POLYTECHNIC OF SRIWIJAYA	84
ID: 4151	84
Siswandi, ^{1,*} Anton Firmansyah ² , Destra Andika Pratama ³ , Yessi Marniat ⁴ , Ichwaldi Amzah ⁵ , Muhammad Irfan Pratama ⁶ , Ichwaldi Amzah ⁷ , Muhammad Irfan Pratama ⁸	84

1,2,3,4,5,6 Politeknik Negeri Sriwijaya, Jl. Srijaya Negara - Kota Palembang, 30139.....	84
7,8 Politeknik Mukah Sarawak, KM 7.5, Jalan Oya 96400 Mukah Sarawak, Malaysia	84
IDENTIFICATION OF ROAD CONDITION SURVEY RESULTS ON THE MAKING OF MAP OF PALEMBANG CITY	85
ROAD NETWORK BASED ON GIS	
ID: 3806.....	85
Norca Praditya ¹ , Indrayani ^{1,*} , Andi Herius ¹ , Kosim ¹ , Tata Peryoga ² , Mendro Anggoro ²	85
¹ Civil Engineering Department, Politeknik Negeri Sriwijaya, Palembang Indonesia	85
² IDN Western Australia, Perth	85
MODELLING DESIGN DIFFUSER HORIZONTAL AXIS WIND TURBINE	86
ID: 3889.....	86
Fatahul Arifin ^{1,*} , RD Kusumanto ³ , Yohandri Bow ² , Ahmad Zamheri ³ , Rusdianasari ² , Min Wen Wang ⁴ , Afries Susandi ² , Yusuf Dewantoro Herlambang ^{5,1} ¹ Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
² Department of Electrical Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
³ Department of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	86
⁴ Department of Mechanical Engineering, National Kaohsiung University Science and Technology, No. 415, Jiangong Rd, Kaohsiung, Taiwan	86
⁵ Department of Mechanical Engineering, Politeknik Negeri Semarang, Jl. Prof. Sudarto, Semarang, Indonesia ...	86
DESIGN WIND TURBINE FOR EXHAUST WIND AREA COAL MINING	87
ID: 3947.....	87
RD Kusumanto ¹ , Fatahul Arifin ^{2,*} , Carlos R.S ¹ , Ahmad Zamheri ² , Rusdianasari ³ , Min Wen Wang ⁴ , RM Fauzi ³ , Yusuf Dewantoro Herlambang ⁵	87
¹ Department of Electrical Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
² Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
³ Department of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara, Palembang, Indonesia	87
⁴ Department of Mechanical Engineering, National Kaohsiung University Science and Technology, No. 415, Jiangong Rd, Kaohsiung, Taiwan	87
⁵ Department of Mechanical Engineering, Politeknik Negeri Semarang, Jl. Prof. Sudarto, Semarang, Indonesia ...	87
The Production of Biogas and Electrical Energy from Market Waste at Fixed Dome Bio-digester in Talang Banjar Jambi	88

ID: 4062.....	88
Leila Kalsum ^{1,*} Yordan Hasan ² , Rusdianasari ¹ , Aida Syarif ¹ , Dayaningrat ¹ , Syaiful M ¹	88
¹ Renewable Energy Study Program, Sriwijaya State Polytechnic, Palembang Indonesia	88
² Electronic Engineering Sriwijaya State Polytechnic, Palembang Indonesia.....	88
Comparison Progressive Web Application in Learning Management System (LMS)	89
ID: 4087.....	89
Dian Nugraha ^{1,*} Febria Anjara ² , Safira Faizah ³	89
^{1,3} Faculty Engineering & Computer Science, Jakarta Global University, West Java-Indonesia	89
² Faculty Economy & Business, Jakarta Global University, West Java-Indonesia	89
The Effectiveness of Solar panels From The Installation Location Changes In Angle and Light	90
ID: 4047.....	90
Yessi Marniati ^{1,*} , Nofiansah ¹ , Herman Yani ¹ , Siswandi ¹	90
¹ Electrical Engineering Departement, Politeknik Negeri Sriwijaya, Palembang Indonesia.....	90
THE NUMBER OF VISITORS OF THE TELECOMMUNICATION ENGINEERING LABORATORY THE PANDEMIC TIME CORONA VIRUS DISEASE LIMITDURING2019 (COVID-19) BASED ON THE INTERNET OF THINGS	91
ID: 4049.....	91
M. Zakuan Agung ^{1,*}), Suzan zefi ²), R.A Halimatussa'diyah ³), Rapiko Duri ⁴), Dea Rahma Dona ⁵), Fitri Rahma Daliza ⁶)	91
¹⁻⁶ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	91
Energy Management on Electric Vehicles Using Fast Charging Banking Capacitor using Internet of Things (IoT) System	92
ID: 4051.....	92
Selamat Muslimin ^{1,*} Renny Maulidda ¹ Evelina ¹ M. Nawawi ¹ Iskandar Lutfi ¹ Johansyah Al Rasyid ¹ M. Fadli ¹ Puput Anggraini ¹ M. Yusuf ¹ Wanda Merian PA ¹	92
¹ Politeknik Negeri Sriwijaya.....	92
Implementation of Solar Cells as an Alternative Energy Source for Automatic Water Tank Filling in Hydroponic System	93
ID: 4064.....	93
Yudi Wijanarko ¹ Renny Maulidda ^{1,*} Masayu Anisah ¹ Evelina ¹ Sara Yulida ¹ Tarisa Ramadhani ¹ Phillips Dharmaraj ² Metrina Jasman ³	93
¹ Politeknik Negeri Sriwijaya, Palembang, Indonesia	93
² Politeknik Kota Kinabalu, Malaysia	93
³ SMK Negeri 1 Indralaya Selatan, Indonesia	93

	94
IMPLEMENTATION OF SMART GRID SYSTEM FOR ALTERNATIVE ENERGY POWER PLANTS SOURCES	
ID: 3786.....	94
Masayu Anisah ¹ Yudi Wijanarko ¹ Renny Maulidda ^{1,*} Johansyah Al Rasyid ¹ Dimas Prasetya WP ¹ M. Dandy Ramadhan ¹ Mohammad Noviansah ¹	94
¹ State Polytechnic of Srwiwijaya.....	94
IMPLEMENTATION OF SMART GRID SYSTEM ON ALTERNATIVE ENERGY OF FLOATING HOUSES AT MUSI RIVER BANK ESTUARY OF THE OGAN RIVER	95
ID: 3790.....	95
Yudi Wijanarko ¹ , Adi Syakdani ¹ , Ekawati Prihatini ¹ , Sairul Effendi ¹ , Aulia Rizki Utami ¹ , Trigitha Melintika ¹ , Ryo Pakusadewo ¹	95
¹ Electrical Engineering Department, Politeknik Negeri Sriwijaya	95
The Effect of Carbonization Temperature and Concentration of KOH Activator on the Quality of Eucalyptus Pellita	96
Activated Carbon in Fe Absorption	
ID: 4063.....	96
Leila Kalsum ^{1*)} , Idha Silviyati. ¹⁾ , Jenie Fahlevi Putri ¹⁾	96
¹ Department of Chemical Engineering Study Program, Sriwijaya State Polytechnic, Bukit Besar, Palembang 30139, Indonesia.....	96
SOLAR PANEL AS ALTERNATIVE ENERGY SOURCE FOR WATER PUMP CONTROL SYSTEM AT THE FLOATING HOUSE IN THE PALEMBANG MUSI RIVER BANK	97
ID: 4101.....	97
Ekawati Prihatini ¹ , Yudi Wijanarko ² , Yeni Irdyanti ³ , Herman Yani ⁴ , Muhammad Aldo Pratama ⁵ , Suryani ⁶ , Charles Sumion ⁷	97
¹⁻⁶ Electrical Engineering Department, Polytechnic State of Sriwijaya, Jalan Srijaya Negara Bukit Besar Palembang City, South Sumatera, 30139, Indonesia	97
⁷ Politeknik Kota Kinabalu, Jalan Politeknik No. 4 KKIP Barat, 88460 Kota Kinabalu Industrial Park, Sabah, Malaysia	97
	98
Comparison of Batteries Used in Electrical Vehicles (A Review)	
ID: 4103.....	98
Selamat Muslimin ^{1,*} Zainuddin Nawawi ² , Bhakti Yudho Suprpto ³ , Tresna Dewi ⁴	98

1,2,3,4 Electrical of Engineering, University of Sriwijaya.....	98
Hardware Design and Simulation of Lung Sound Detector to Analyze Lung Abnormalities Based On Arduino Mega, NodeMCU ESP32, and Internet of Things	99
ID: 4125.....	99
Amperawan ¹ , Destra Andika ² , Dewi Permatasari ³ , Sabilal Rasyad ⁴ , Zainudin b Mat Taib ⁵ , Nuwairani Azurawati bt Siha ⁶ , Aldi Wijaya ⁷ , Muhammad Taufiqurrahman Arrasyid ⁸	99
¹⁻⁶ Department of Electronic Engineering, Politeknik Negeri Sriwijaya, JL.Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia.....	99
, Politeknik Negeri Sriwijaya, JL.Srijaya Negara Bukit Besar, Palembang , 30139, Indonesia.....	99
⁷⁻⁸ Department of Electrical Engineering, Politeknik Mukah Serawak, JL. Oya-Mukah KM 7, Mukah Serawak, 9640, Malaysia.....	99
.....	100
Design of Touch Key-Voice Command Based Vehicle Additional Security System	
ID: 3791.....	100
Muhammad Firdaus Jauhari ^{1,*} , Rusmini Sri Maryati ¹ , Raihan ¹	100
¹ Automotive Mechanical Engineering, Politeknik Negeri Banjarmasin, Banjarmasin, Indonesia,	100
.....	101
AUTOMATION OF THE PALEMBANG SEMAGE FABRIC YARN SPINNER	
ID: 3694.....	101
Eka Susanti ¹⁾ , Ica Admirani ²⁾ , Romi Wilza ³⁾ , Irawan Hadi ⁴⁾ , Sholihin ⁵⁾	101
¹⁻⁵ State Polytechnic of Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	101
.....	102
WebRTC Signaling Using nprtc For OnlineVirtual Classroom	
ID: 4088.....	102
Raswa ^{1,*} Sumarudin ^{2,*} Eka Siswantohadi ^{3*}	102
¹ Politeknik Negeri Indramayu	102
² Politeknik Negeri Indramayu	102
³ Politeknik Negeri Indramayu	102
.....	103
IoT-Based Technological Innovation in Improving the Productivity of Macan Kumbang Fish Cultivator	
ID: 3730.....	103
Nelly Masnila ¹ , Hendradinata ² , Indra Griha Tofik Isa ^{3,*} , Riana Mayasari ⁴	103

1,4 Accounting Department, Politeknik Negeri Sriwijaya	103
2 Mechanical Engineering Department, Politeknik Negeri Sriwijaya	103
3 Informatics Management Department, Politeknik Negeri Sriwijaya	103
.....	104
TPACK FRAMEWORK BASED INTERACTIVE DIGITAL LEARNING	
ID: 3777	104
Hetty Meileni ^{1,*} , Indra Satriadi ² , Sony Oktapriandi ³ , Desi Apriyanty ⁴	104
¹⁻⁴ State Polytechnic Of Sriwijaya	104
DEVELOPMENT OF MULTI PLATFORM GEOGRAPHIC INFORMATION SYSTEM ASSESSMENT OF PROSPECTIVE	
.....	105
BIDIKMISI STUDENTS USING REUSE DRIVEN SOFTWARE DEVELOPMENT PROCESS METHOD	
ID: 3788	105
M Aris Ganiardi ¹ , Nita Novita ² , Indri Ariyanti ³ , Delta Khairunnisa ⁴	105
¹⁻⁴ Informatics Management Department, Politeknik Negeri Sriwijaya, Srijaya Negara Street, Palembang, 30139, Indonesia	105
.....	106
DEVELOPMENT OF 3D MULTIMEDIA AS A LEARNING TOOLS ONLINE BASED VIRTUAL REALITY	
ID: 3797	106
Sholihin ¹⁾ , Emilia Hesti ²⁾ , Sarjana ³⁾ , Adewasti ⁴⁾	106
¹⁻⁴ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	106
.....	107
Design of Air Quality Monitoring System Using LoRa Communication Technology	
ID: 3799	107
Mohammad Fadhli ^{1,*} , Asriyadi ¹ , Lindawati ¹ , Irma Salamah ¹	107
¹ Politeknik Negeri Sriwijaya	107
.....	108
INNOVATION TECHNOLOGY OF LEKOR DOUGH MIXER BASED INTERNET OF THING	
ID: 3861	108
Suzan Zefi ¹ , Eka Susanti ² , M. Zakuan Agung ³ , R.A Halimatussa'diyah ⁴	108
¹ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	108
DEVELOPMENT OF 3D MULTIMEDIA AS A PRACTICAL SUGGESTION FOR VIRTUAL REALITY-BASED DIGITAL	
.....	109
ENGINEERING	

ID: 3857.....	109
Martinus Mujur Rose ¹⁾ , Sholihin ²⁾ , Sarjana ³⁾ , Ir. H. Abdul Rakhman ⁴⁾ , Ir. Ali Nurdin ⁵⁾	109
¹⁻⁵ Department of Polytechnic Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia	109
.....	110
Single Page Application for Business Intelligence Dashboard	
ID: 3521.....	110
M. Miftakul Amin * ¹ , Adi Sutrisman ² , Yevi Dwitayanti ³	110
^{1,2} Department of Computer Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	110
³ Department of Computer Accounting, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	110
.....	111
Evaluating Users' Emotion in Web-Based Geographic Information System	
ID: 4025.....	111
Leni Novianti ¹ , Indra Griha Tofik Isa ^{2,*} , Indri Ariyanti ³ , Rika Sadariawati ⁴ , Anitawati Mohd Lokman ⁵ , Azhar Bin Abd Aziz ⁶ , Afiza Binti Ismail ⁷	111
¹²³⁴ Politeknik Negeri Sriwijaya, Palembang, Indonesia	111
⁵⁶⁷ Universiti Teknologi MARA, Shah Alam, Malaysia	111
.....	112
The Best Academic Administration Personnel Selection Model Using the Weighted Sum Model (WSM)	
ID: 3535.....	112
M. Miftakul Amin * ¹ , Yevi Dwitayanti ²	112
¹ Department of Computer Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	112
² Department of Computer Accounting, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Bukit Besar, Palembang, 30139, Indonesia	112
Establishing the Interface for G-Bot Monitoring and Controlling System	
ID: 3800.....	113
Dewi Permata Sari ¹ , Fatma Indah Sari ² , Nyayu Latifah Husni ^{3,*} , Nurhaida ⁴ , Yogi Eka Fernandes ⁵ , Ade Silvia Handayani ⁶	113
¹⁻⁵ Electronic Engineering Study Program, Electrical Engineering Department, Sriwijaya State Polytechnic.....	113
⁶ Telecommunication Engineering Study Program, Electrical Engineering Department, Sriwijaya State Polytechnic	113

.....	114
Design of a 4G signal amplifier repeater biquad antenna at 1800 MHz	
ID: 3990.....	114
Ade Silvia Handayani ^{1*} , Sopian Soim ² , Ciksadan ³ , Rivaldo Arviando ⁴	114
¹⁻⁴ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	114
.....	115
Design and Configuration of 4G Repeater Booster Device at 1800MHz	
ID: 3988.....	115
Ade Silvia Handayani ^{1*} , Sopian Soim ² , Emilia Hesti ³ , Ciksadan ⁴ , Nyayu Latifah Husni ⁵ , Abu Hasan ⁶	115
¹ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia	115
MULTIMEDIA DEVELOPMENT AS CREATIVITY IN THE SOCIALIZATION OF COVID19 VACCINATION AGAINST THE PUBLIC	116
ID: 3863.....	116
Dewi Irmawati ^{1*} , Devi Sartika ² , Ienda Meiriska ³ , Leni Novianti ⁴	116
^{1,,2,3,4} Study Program of Informatics Management, State Polytechnic of Sriwijaya	116
PERFORMANCE OPTIMATMIZATION OF YAGI ANTENNA DEVICES FOR DETECTING QUALITY LEVELS RIVER WATER BASED ON THE INTERNET OF THING	117
ID: 3767.....	117
Irawan hadi ^{1*} , Martinus Mujur Rose ¹ , Adewasti ¹ , Ciksadan ¹	117
¹ State Polytechnic of Sriwijaya, Jalan Srijaya Negera, Bukit Besar, Palembang - Indonesia.....	117
.....	118
Preliminary study: M-Health based on IoT and Machine Learning	
ID: 4032.....	118
Ahmad Taqwa ^{1*} , Ade Silvia Handayani ² , Sopian Soim ³ , Carlos RS ⁴ , Rahmat Budiarto ⁵ , Syifa Amira Zahra ⁶ , Junio Andika Danda ⁷	118
¹ Politeknik Negeri Sriwijaya.....	118
⁵ AlBaha University, KSA.....	118
.....	119
Analysis of Android-based Body Health Monitoring System Results using Fuzzy Mamdani Method	
ID: 3989.....	119
Ade Silvia Handayani ^{1*} , Ahmad Taqwa ² , Irawan Hadi ³ , Martinus Mujur Rose ⁴ ,.....	119

Nyayu Latifah Husni ⁵ , Sopian Soim ⁶ , Ratri Agustina ⁷	119
¹⁻⁷ Department of Electrical Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	119
*Corresponding author. Email: ade_silvia@polsri.ac.id.....	119
.....	120
Design of Application an Intelligent Transportation System for Monitoring Traffic Accidents	
ID: 4035.....	120
*Ade Silvia Handayani ¹ , Sopian Soim ² , Carlos RS ³ , Syifa Amira Zahra ⁴ , Elisa Islami Putri ⁵	120
¹⁻⁵ Politeknik Negeri Sriwijaya	120
GEOGRAPHIC INFORMATION SYSTEM MAPPING AND MANAGEMENT OF CHILD WITH THE HIGHEST NUTRITIONAL POTENTIAL IN PRABUMULIH CITY USING K-MEANS CLUSTERING METHOD (CASE STUDY:	121
PRABUMULIH CITY HEALTH OFFICE)	
ID: 4096.....	121
Leni Novianti ^{1,*} , Robinson ² , Ienda Meiriska ³ , Resti Atika Sari ⁴	121
^{1,2,3,4} Study Program of Informatics Management,State Polytechnic of Sriwijaya.....	121
.....	122
COVID 19 Detection Application At Siti Fatimah Hospital Method of Using Deep Learning	
ID: 4098.....	122
Jayah ¹ , Leni Novianti ^{1,*} , Ida Wahyuningrum	122
¹ Informatics Management, State Polythecnic of Sriwijaya	122
Visual Studio Code for Activity Monitoring Interface	123
Nyayu Latifah Husni ^{1,*} Putri Adelia Rahma Sari ² Tresna Dewi ³ Ade Silvia Handayani ⁴ Devi Sartika ⁵ Akhmad Mirza ⁶	123
ID 4114.....	123
¹⁻⁶ State Polytechnic of Sriwijaya.....	123
*Corresponding author. Email: ade_silvia@polsri.ac.id	123
Solar Panel Analysis for Activity Monitoring System	124
ID 4111.....	124
Nyayu Latifah Husni ¹ , Putri Adelia Rahma Sari ² , Ade Silvia Handayani ^{3,*} , Yeni Irdyanti ⁴ A. Rakhman ⁵ , Hairul ⁶ , Seyed Amin Hosseini Seno ⁷ Wahyu Caesarendra ⁸	124
.....	125
THE INNOVATION OF SOUTH SUMATERA TRADITIONAL BATIK E-COMMERCE APPLICATIONS	
ID: 3847.....	125

Ayu Chotibah ^{1*} , Bainil Yulina ² , Desi Aprianty ³ , Evada Dewata ⁴ , Pridson Mandiangan ⁵	125
^{1,2,3,4,5} Politeknik Negeri Sriwijaya	125
THE ANALYSIS OF COST QUALITY ON PRODUCTIVITY OF IRON RAILING PRODUCTS IN SMALL AND MEDIUM	126
BUSINESS IN PALEMBANG	
ID: 3683.....	126
M. Thoyib ¹ , Riza Wahyudi ¹ , Firmansyah ¹ , Darul Amri ¹	126
¹ State Polytechnic of Sriwijaya	126
.....	127
Quality of Financial Reporting and Impact of GGG Implementation: Study on Local Government in Indonesia	
ID: 3757.....	127
Nelly Masnila ¹ , Firmansyah ² , Jovan Febriantoko ³ , Riana Mayasari ^{4*} , Jamaliah Said ⁵	127
^{1,2,3,4} Department of Accounting, State Polytechnic of Sriwijaya, Palembang, Indonesia	127
⁵ Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia	127
An Error Analysis of English Sentence Construction in Writing Subject Made by the Students of the English Department	128
at Sriwijaya State Polytechnics	
ID: 3796.....	128
Evi Agustina Sari ^{1*} , Sri Gustiani ¹ , Yusri ¹ , Tiur Simanjuntak ¹	128
¹ Sriwijaya State Polytechnics	128
.....	129
DISCLOSURE OF SUSTAINABLE PERFORMANCE IN HIGHER EDUCATION IN INDONESIA	
ID: 3827.....	129
Edwin Frymaruwah ¹ , Farah Aida Ahmad Nadzri ² , Periansya ¹ , Evada Dewata ¹	129
¹ Department of Accounting, Politeknik Negeri Sriwijaya, Palembang, Indonesia.....	129
.....	130
Improvement of LPKA Class 1 Palembang Electronic Dashboard with Field Performance Monitoring	
ID: 3976.....	130
Hendra Hadiwijaya ¹ , Febrianty ² , Rezania Agramanisti Azdy ^{3*}	130
^{1,2} Accounting Study Program, Palembang Palcomtech Polytechnic, Indonesia	130
³ Informatics Study Program, STMIK PalComTech, Indonesia.....	130

OPTIMIZATION OF INCOME PARAMETERS OF SONGKET CRAFTSMEN ON KOPERASI SONGKET PALEMBANG	131
ID: 3853.....	131
Neneng Miskiyah ^{1*} , Purwati ¹ , Yulia Pebrianti ¹ , Ketu Purnamasari ¹	131
¹ Department of Business Administration, Sriwijaya State Polytechnic, Palembang, Indonesia	131
.....	132
Welfare Evaluation of the Duck Breeding in Gandus Subdistrict, Palembang	
ID: 3994.....	132
Marieska Lupikawaty ^{1*} , Neneng Miskiyah ¹ , Purwati ¹ , Ketu Purnamasari ¹ , Julito Contado Aligaen ²	132
¹ Business Management Study Program, Department of Business Administration, Sriwijaya State Polytechnic ..	132
² Social Science Department, Iloilo Science, and Technology University Philippines	132
.....	133
Stock Price Valuation Using the Dividend Discount Model on IDX Mining Period 2011-2020	
ID: 3995.....	133
Dinda Febriani ¹ , Marieska Lupikawaty ^{1*} , Al Hushori ² , Haris Wilianto ²	133
¹ Sriwijaya State Polytechnic Business Management Study Program.....	133
² Business Administration Study Program, Sriwijaya State Polytechnic	133
Digital Branding Model for Jumputan and Songket Fabrics: as a Continuity Strategy for Marketing Palembang Local	134
Products	
ID: 4019.....	134
Desloehal Djumrianti ¹ , Rita Martini ² , Ikhtison Mekogga ³ , Alfitriani ⁴	134
¹ Business Administration Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
² Accounting Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
³ Computing Technique Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
⁴ Business Administration Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia	134
.....	135
Perceptions of Use of Food Delivery Applications and Its Impact on Sales of Culinary Traders in Palembang City	
ID: 4023.....	135
Muhammad Husni Mubarak ¹ , Desi Indriasari ¹ Eka Jumarni ¹ Indra Satriawan ¹	135
¹ Department of Accounting, State Polytechnic of Sriwijaya, Palembang	135

Effect of Labor, Technology and Experience On Productivity of Rubber Smallholders In Kabupaten Banyuasin With Training as Moderating Variables	136
ID: 4038.....	136
Yahya ^{1,*} M. Yusuf ² , Elisa ³ , Yusnizal Firdaus ⁴ , AlHushori ⁵ , Suyatno Ladigi ⁶	136
^{1,2,3,4,5} Department of Business Administration, Sriwijaya State Polytechnic, Indonesia.....	136
⁶ Sosial Sains Gunaan, Universiti Sultan Zainal Abidin, Terengganu, Malaysia	136
DETERMINATION OF THE PERFORMANCE OF LOCAL GOVERNMENTS WITH AUDIT OPINIONS AS MODERATION VARIABLES IN SOUTH SUMATRA	137
ID: 4075.....	137
Niken Ayuningrum ¹ , Dian Ofasari ²	137
¹ Accounting Study Program, Sekayu Polytechnic.....	137
.....	138
Factors Affecting Customer Adoption to Mobile Banking Service	138
ID: 4137.....	138
Dewi Fadila ^{1,*} Hendra Sastrawinata ² . Markoni Badri ³ . Agung Anggoroseto ⁴	138
Mohd. Fadzli bin Ahmad ⁵ . Tayie Anak Ankus ⁶	138
¹ Business Administration Department. State Polytechnic of Sriwijaya, Indonesia.....	138
^{2,3,4} Business Administration Department. State Polytechnic of Sriwijaya, Indonesia	138
^{5,6} Commerce Deptatment. Politeknik Mukah Malaysia	138
The Role of Product Differentiation and Word of Mouth Promotion on Purchase Decision of Creative Industrial Products In Semarang City Waste Bank	139
ID: 3872.....	139
Hikmah ¹ , Andalan Tri Ratnawati ¹ , Susetyo Darmanto ^{1,*}	139
¹ Fakultas Ekonomika dan Bisnis, Universitas 17 Agustus 1945 Semarang, Semarang, Indonesia,	139
.....	140
ACCOUNTING COMICS AS A MEDIUM OF LEARNING	140
ID: 3893.....	140
Rosy Armaini ¹⁾ , Maria Maria ²⁾ *, Leni Noviyanti ³⁾ , and Yevi Dwitayani ⁴⁾	140
^{1,2,4)} Accounting Department, State Polytechnic of Sriwijaya,	140

3) Informatics management Department. State Polytechnic of Sriwijaya,	140
.....	141
The Effect of Servicescape on Tourist Revisit Intention at Water Sports and Recreation Tourism Destination	
ID: 3915.....	141
Ambarwati, Risma ¹ , Iswan, Salsabila Rahmadina Putri ² , Ridho, Sari Lestari Zainal ^{3,*} , Jauhari, Hadi ⁴ , Paisal ⁵ , Afrizawati ⁶	141
¹²³⁴⁵⁶ Politeknik Negeri Sriwijaya	141
THE FACTORS AFFECTING REGIONAL EXPENDITURES ON REGENCY/MUNICIPALITY IN SOUTH SUMATERA	
.....	142
PROVINCE	
ID: 3949.....	142
Sherly Amerta Agustina ^{1,*} , M. Thoyib ¹ , Nurhasanah	142
¹ State Polytechnic of Sriwijaya	142
.....	143
Evaluation of Regional Financial Management Based on Local Government Information Systems	
ID: 3981.....	143
Maitsarana Ishmaturahwa ¹ , Sulaiman ¹ , Rita Martini ^{1*} , M. Thoyib ¹ , Kartika Rachma Sari ¹	143
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	143
.....	144
FINANCIAL PERFORMANCE ANALYSIS AT PT BANK MUAMALAT INDONESIA, Tbk.	
ID: 3983.....	144
M.Thoyib ^{1*} , Rita Martini ¹ , Tarisa Salsabella ¹ , Marsahanda Aprilia ¹	144
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	144
Poverty Reduction in South Sumatera with Optimization of Village Funds, Allocation of Village Funds, and Village	
Original Income	
ID: 3771.....	145
Rita Martini ^{1*} , Endah Widyastuti ¹ , Sukmini Hartati ¹ , Zulkifli ¹ , Mardhiah ¹	145
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	145
PROFITABILITY, COMPANY SIZE, AUDIT DELAY, AND FINANCIAL REPORTING DELAYS IN COVID-19 PANDEMIC	
.....	146
ERA	
ID: 3855.....	146

Sukmini Hartati ¹ , Rita Martini ¹ , Desri Yanto ¹ , Indriani Indah Astuti ¹ , Kartini Binti Ibrahim ²	146
¹ Polytechnic State of Sriwijaya, Palembang, Indonesia	146
² Polytechnic of Mukah, Malaysia	146
.....	147
Hotel and Restaurant Taxes Role to the Local Original Revenue of Regency/City in South Sumatera	
ID: 4001.....	147
Sovi Julianda Wahya ¹ , Sukmini Hartati ¹ , Eka Jumarni Fithri ¹ , Rita Martini ^{1*}	147
¹ Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	147
THE CALCULATION OF PRODUCT COMBINATION BY USING LINEAR PROGRAMING SIMPLEX METHOD TO	
.....	148
PROFIT MAXIMIZE AT ROTI SAHABAT PALEMBANG CITY	
ID: 4033.....	148
Nurya Mellinda ¹ , Afrizawati ² , Elisa ³ , M.Riska Maulana Effendi ⁴ , Paisal ⁵ , Alia Putri Benari ⁶ , Nadia Dwi Putri ⁷	148
¹⁻⁷ Polytechnic State of Sriwijaya	148
...	149
The Factors Affecting Food Delivery Application Users Shopping Routine Behavior during the Covid-19 Pandemic	
ID: 4013.....	149
Ridho, Sari Lestari Zainal ^{1*} , Sabli, Habsah Binti Haji Mohamad ² , Ibrahim, Kartini Binti Che ³ , Jauhari, Hadi ⁴ , Detmuliati, Alditia ⁵ , Alfitriani ⁶ , Putri, Anggita Prameswari Pracena ⁷	149
¹⁴⁵⁶⁷ Politeknik Negeri Sriwijaya, Palembang, Sumatera Selatan, Indonesia.....	149
²³ Politeknik Mukah, Mukah, Sarawak, Malaysia	149
.....	150
Internal Control System Affects the Quality of Financial Report Information Palembang City Government	
ID: 4053.....	150
Rita Martini ^{1*} , Fildzah Rahmah Satirah ² , Nurhasanah ³ , Kartini binti Che Ibrahim ⁴ , Kartika Rachman Sari ⁵ , Endah Widyastuti ⁶ , Farida Husin ⁷ , Amelia Agustia Riskya Saputri ⁸	150
^{1,2,3,5,6,7,8} Accounting Department, Polytechnic State of Sriwijaya, Palembang 30139, Indonesia.....	150
⁴ Trade Department, Politeknik Mukah, Sarawak, Malaysia	150
GOOD GOVERNANCE AND INTERNAL CONTROL ON THE PREVENTION OF FRAUD IN THE PROCUREMENT OF	
.....	151
GOODS AND SERVICES FOR GOVERNMENT AGENCIES	
ID: 4076.....	151
Evada Dewata ^{1*} , Elfira Hidayanti ² , Yuliana Sari ¹ , Hadi Jauhari ³	151

¹ Accounting Department, State Polytechnic of Sriwijaya Palembang, Indonesia.....	151
² Alumni of the Public Sector Accounting, Study Program of State Polytechnic of Sriwijaya.....	151
³ Business Administration Department, State Polytechnic of Sriwijaya Palembang, Indonesia.....	151

INFLUENCE OF INDEPENDENCE, DUE PROFESSIONAL CARE AND ACCOUNTABILITY ON AUDIT QUALITY ON
152

THE AUDIT BOARD OF THE REPUBLIC OF INDONESIA REPRESENTATIVE PROVINCE OF SOUTH SUMATRA

ID: 4078.....	152
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Fipiariny. S ¹ , Nurhayati ²	152
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¹⁻² Accounting Study Program, Anika Palembang Polytechnic.....	152
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Dragon Fruit Peel Extract as Antioxdant Natural Cosmetic Using Rotary Evaporator

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ABSTRACT

The use of cosmetics for young people in the current era has become a trend in itself. Many cosmetic brand products on the market make people have to be literate about what content they contain. Generally, cosmetics with natural ingredients are the target of young people. Extraction of dragon fruit peel is an alternative to using waste to produce advanced materials in the field of natural cosmetics. The aims of this research is to determine the evaporation rate using a rotary evaporator by varying the amount of solvent and evaporation time in order to obtain the appropriate extract. The procedure of this research is by preparing the raw material used, namely dragon fruit peel waste. The dragon fruit peel that have been smooth are added with solvents using 70%, 60%, and 50% ethanol and 1% HCl for 24 hours with a certain ratio. After that it is filtered to get the maserate. Then the results of the macerate were put into the evaporator at a temperature of 80 - 90 °C for a certain time (10, 20, 30, and 40 minutes) and the rate of evaporation was observed. The results of the analysis will be used to determine the rate of evaporation and the quality of the dragon fruit peel extract obtained. From the evaporation results, the maximum evaporation rate was obtained at 40 minutes at a variation of 70% ethanol, which was 0.5 mL/minute. The dragon fruit peel's antioxidant content was obtained by an average of 92% - 93%.

Keywords: *Extraction, Dragon fruit peel, Antioxidant, Evaporation*

1. INTRODUCTION

Indonesia's population of 267 million people with a population of 130 people are women, making Indonesia a lucrative market for cosmetic products [1]. The Ministry of Industry noted that in 2017, as much as 95 percent of the national cosmetic industries are the small and medium industry (IKM) sector.

Consumption of dragon fruit in large levels will produce dragon fruit peel waste that is rarely used. Dragon fruit skin is widely used as fertilizer and food coloring. In fact, dragon fruit peel also has antioxidant capacity, antiproliferative effect [2], and as a

moisturizer in cosmetic products [3]. In red dragon fruit, peel's antioxidant activity is greater than fruit flesh, where the dragon fruit peel has antioxidant activity of 83.48% with an IC50 of 0.30 mg/mL [4].

The antioxidant nutrients in red dragon fruit are useful for preventing premature aging due to exposure to free radicals, preventing and eliminating acne so that dragon fruit peel waste can be an alternative for healthy cosmetics that can be used [5]. With proper processing, dragon fruit peel waste will be extracted and processed through an evaporation.

Extraction is separating materials process from the mixture using solvent. The extraction was stopped when equilibrium reached between solvent concentration and plant cell concentration.

Evaporation is a process that aims to concentrate a solution consisting of a volatile solvent and a non-volatile solute. One of the tools used in the evaporation process is a rotary evaporator. Rotary evaporator is vacuum system tool that functions in lower pressure around the sample liquid which will lower the boiling point of the liquid component or solution. The output from a rotary evaporator (the desired product) can usually be a solid or a concentrated solution. The advantage of this rotary evaporator is that it is superior in separation and does not damage the solvent if the separation occurs at high temperatures [6]

The red dragon fruit peel (*Hylocereus polyrhizus*) contains nutrients such as carbohydrate, fat, proteins and fiber. The fiber that contained in the skin of the red dragon fruit is about 46.7% [7]. It is higher than pears, oranges and peaches [7].

The extract of peel's dragon fruit has better antioxidant activity than the fruit extract because its higher phenolic content [8]. This is in accordance with research conducted by [4] which stated that in 1 mg/ml red dragon fruit peel was able to inhibit $83.48 \pm 5.03\%$ free radicals, while dragon fruit flesh was only able to inhibit free radicals by $27.45 \pm 1.02\%$.

Antioxidants function to resist the attack of free radicals, compounds that can cause degeneration so that they can prevent or inhibit the process damage due to oxidation of fats, proteins and nucleic acids. Antioxidants act as chemical cancer-preventing and inflammatory agents by reducing risk of death from cardiovascular causes [9].

Antioxidants activity are influenced by many factors such as lipid content, antioxidants concentration, temperature, oxygen tension, and chemical components of food in general such as protein and water. The process of antioxidant inhibition varies depending on the chemical structure and various mechanisms. In this mechanism the most important is the reaction with lipid free radicals, which form inactive products [10].

Chemically, antioxidants compound electron donors. Biologically, it can reduce the oxidants negative impact. Antioxidants work by inhibiting oxidant with donating one electron to other compound [11]. The body needs antioxidant to protect it from radical attack. Antioxidants level are chemical components that able to inhibit the oxidation damage.

2. EXPERIMENTAL PROCEDURE

2.1. Materials

The raw material is dragon fruit peel with weight of 10 gram which is procced with ethanol 50% - 70% and HCl 1%, maserased until 24 hours, separated into maserate and rafinate. The maserat is procced into extract dragon fruit peel with evaporation process in certain times, analized the evaporation rate and antioxidant number.

2.2. Equipments



Figure 1 Rotary Evaporator

The equipments used in this research are a set of tools for maceration and a set of rotary evaporation,

3. RESULTS AND DISCUSSION

The data for evaporation from raw material of 10 grams of dragon fruit peel with solvent concentrations variations 50%, 60%, and 70% and evaporation time of 10-40 minutes at an evaporation temperature maintained at 80-90 °C show in Table 1.

Table 1 shows that the longer evaporation time, the more volatile substances will be excreted. Substances that have a greater concentration and are more volatile, will also evaporate quickly. This is the same result which reported that with the long drying treatment, the longer the heating lasts, the faster evaporation of water in the material occurs so that the water content decreases [12].

Table 1. Result of Evaporation in Many Evaporation Time

Solvent Concentration (%)	Evaporation time (minutes)	Extract volume in (mL)	Extract volume out (mL)
50	10	100	98
	20	100	98
	30	100	98
	40	100	97
60	10	100	95
	20	100	93.2
	30	100	90
	40	100	86
70	10	100	98
	20	100	93
	30	100	90
	40	100	80

Analysis of antioxidant number in a solution of dragon fruit peel extract using the dpph method by determining the maximum absorption wavelength of DPPH.

Table 2 . Antioxidant Number Analysis in Dragon Fruit Peel Extract

Solvent Concentration (%)	Evaporation Time	Antioxidant Number (%)
50	10	93.435
	20	94.342
	30	93.155
	40	91.911
60	10	91.908
	20	93.157
	30	93.522
	40	90.508
70	10	92.375
	20	92.829
	30	93.577
	40	93.207

3.1. Effect of Evaporation Time on Evaporation Rate

Evaporation is a process that aims to evaporate volatile solvent and to concentrate non-volatile solute [12]. It is the process of thickening a solution by boiling or evaporating the solvent. Evaporation rate is expressed as the amount of water evaporated per hour [13]. The formula for finding the evaporation rate is:

$$v = \frac{V_o - V_t}{\Delta t} \tag{1}$$

Formula information :

- v = Rate of evaporation (volume/time)
- V_o = Initial Volume (volume)
- V_t = Final Volume (volume)
- Δt = Evaporation Time (time)

From the data processing can be plotted graph. The evaporation rate of dragon fruit peel extract can be described as shown below:

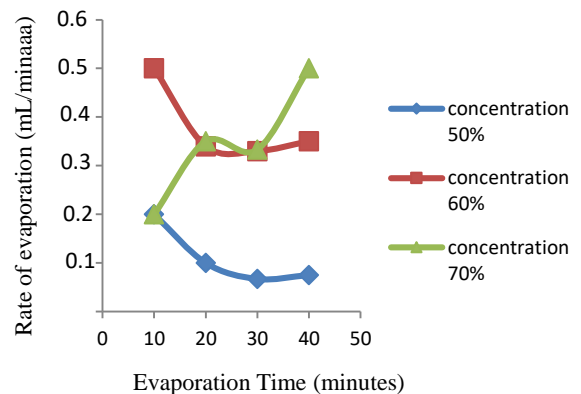


Figure 2. Effect of Evaporation Time in Various Solvent Concentrations on Evaporation Rate

Evaporation rate of ethanol in its separation with dragon fruit peel extract is quite influential. The higher the solvent concentration, the faster evaporation will occur. This can be seen from Figure 2, the solvent concentration of ethanol 70 % evaporates faster and tends to increase at the evaporation time of 40 minutes, which is 0.5 mL/minute.

The solvent using ethanol 60% and HCl 1% increased in the initial 10 minutes, this probably occurred when entering the extract into the evaporator, the heater had reached the desired temperature so that the evaporation rate was quite fast. In contrast to the

treatment with ethanol 70% and HCl 1% at 10 minutes, the heating was carried out while the heater was still cold. For the evaporation time of 20 and 30 minutes, the evaporation rate for ethanol 60% and 70% tends to be constant.

3.2. Effect of Solvent Concentration on Antioxidant Number

Antioxidants are nutritional and non-nutritive substances that are usually found in foodstuffs. Antioxidants prevent the occurrence of oxidative in the body. Antioxidants are radical scavengers, meaning they are able to work and repair body.

From one of the results of research conducted to prove the existence of differences in antioxidant activity which is influenced by the concentration of the solvent used. The difference in antioxidant activity in the extract was due to the difference in polarity of each solvent. In addition, the smaller the concentration of organic solvents used, the lower the costs incurred. However, increasing the concentration of organic solvents during extraction does not necessarily increase antioxidant activity. This makes the need for consideration in the choice of solvent concentration.

The results of this study indicate that evaporation length process and the concentration of the solvent affect the oxidation number of the extract as shown in Figure 3.

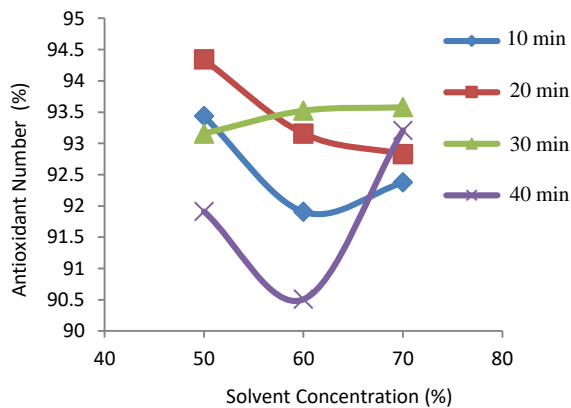


Figure 3. The Effect of Solvent Concentrations in Various Evaporation Times on Antioxidant Numbers in Dragon Fruit Peel Extract

Figure 3 shows that ethanol with a concentration of 70% and with the addition of 1% HCl the oxidant number tends to be more stable at various evaporation times. In contrast to extraction using 60% and 50% ethanol solvents with the addition of 1% HCl, the oxidant number obtained increased and decreased at each evaporation time. So that it can be concluded, the concentration that tends to be good as a solvent in

extracting dragon fruit peel with high antioxidant numbers and tends to be stable is using ethanol with a concentration of 70% and HCl 1%.

Ethanol 70% is a solvent that is more polar than ethanol 96% and more non-polar than ethanol 50% so that polar flavonoid compounds will tend to dissolve more in 70% ethanol. The higher the ethanol concentration, the lower the polarity of the solvent [14]. The more similar the polarity of the solvent with the polarity of the substances contained in the extracted material, the more components of the substance that can be extracted so that an increase in the yield can be obtained [15].

4. CONCLUSION

The highest evaporation rate of ethanol solvent in dragon skin extract was obtained at 0.5 mL/minute. Solvent concentration and evaporation time affect antioxidant value. The antioxidant number which tends to be stable is obtained at a solvent concentration of 70% ethanol: 1% HCl, which is an average of 93% at each evaporation time.

AUTHORS' CONTRIBUTIONS

All of the authors are involved in the process of producing dragon fruit peel extract. The first and corresponding author contribution is responsible for data processing and manuscript writing. The second author is responsible for sharing and consulting about the manuscript writing dan also about the process. The third, fourth, and fifth authors are responsible for analysis evaporation rate and funding arrangement. The sixth, seventh, and eight author are responsible for analysing the antioxidant number.

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