



Nomor Ijazah Nasional: 204042021000250

UNIVERSITAS SUMATERA UTARA

memberikan kepada

Hasnan Gunawan Sinaga

Lahir di Mogang, tanggal 11 Juni 2000

Ijazah

Ahli Madya (A. Md.)

**Program Studi Metrologi dan Instrumentasi
Fakultas Matematika dan Ilmu Pengetahuan Alam**

dengan segala hak dan kewajiban yang melekat pada gelar akademik tersebut.

Diberikan di Medan pada tanggal 23 Juli 2021



Dekan

Dr. Nursahara Pasaribu, M.Sc.
NIP 196301231990032001



Rektor

Dr. Muryanto Amin, S.Sos., M.Si.
NIP 197409302005011002



UNIVERSITAS SUMATERA UTARA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
TRANSKRIP AKADEMIK
Academic Transcript
Nomor Transkrip 11409/UN5.2.1.8/LLS/D-3/2021
Nomor Ijazah Nasional 204042021000250



Nama Mahasiswa / Name of Student : Hasnan Gunawan Sinaga
 Tempat/Tanggal Lahir / Date of Birth : Mogang, 11 Juni 2000
 Nomor Induk Mahasiswa / Student ID Number : 182411007
 Program Pendidikan Tinggi / Education Program : Diploma
 Departemen/Program Studi / Department/Study Program : Metrologi dan Instrumentasi / Metrology and Instrumentation
 Tanggal Terdaftar / Date of Entry : 23 Agustus 2018
 Tanggal Kelulusan/ Date of Completion : 23 Juli 2021
 Prestasi Akademik / Academic Result :
 Jumlah SKS / Number of Credit : 111
 Indeks Prestasi / Grade Point Average : 3.15
 Predikat / Predicate : Sangat Memuaskan / Distinction



Judul Tugas Akhir / Paper :

RANCANG BANGUN SISTEM ALAT PENDETEKSI EMISI GAS KENDARAAN BERMOTOR MENGGUNAKAN SENSOR MQ-7 BERBASIS
 MIKROKONTROLLER ARDUINO NANO / DESIGN OF DETECTION EQUIPMENT SYSTEM MOTOR VEHICLE EXHAUST GAS EMISSIONS USING
 THE SENSOR MODULE MQ 7 ARDUINO NANO MICROCONTROLLER BASED

No.	Kode/ Code	Nama Mata Kuliah/ Subjects	SKS/ Credit	Nilai/ Grade
1	MTR 1 001	Fisika Rekayasa / Physical Engineering	3	B
2	MTR 1 001 P	Praktikum Fisika Rekayasa / Practical Physical Engineering	1	B
3	MTR 1 002	Matematika Rekayasa Dasar / Basic Mathematics Engineering	3	B
4	MTR 1 002 P	Praktikum Matematika Rekayasa Dasar / Practical Basic Mathematics Engineering	1	B+
5	MTR 1 003	Pengantar Metrologi / Introduction to Metrology	2	B
6	MTR 1 004	Menggambar Teknik / Technical Drawing	2	B
7	MTR 1 004 P	Praktikum Menggambar Teknik / Practical Technical Drawing	1	A
8	MTR 1 005	Kimia Rekayasa / Chemical Engineering	2	C
9	MTR 1 006	Undang-Undang Metrologi Legal / Law Of Legal Metrology	2	B
10	MTR 1 007	Bahasa Indonesia / Bahasa Indonesia	1	B+
11	MTR 1 007 P	Praktikum Bahasa Indonesia / Practical Bahasa Indonesia	1	A
12	MTR 1 008	Rangkaian Elektrik dan Elektronika / Electrical and Electronic Circuit	2	B
13	MTR 1 008 P	Praktikum Rangkaian Elektrik dan Elektronika / Practical Electrical and Electronic Circuit	1	B+
14	MTR 1 009	Teknologi Mekanik / Mechanical Technology	3	B+
15	MTR 1 010	Sistem Logika Digital / Digital Logic System	2	B+
16	MTR 1 010 P	Praktikum Sistem Logika Digital / Practical Digital Logic System	1	B
17	MTR 1 011	Statistik / Statistics	2	C+
18	MTR 1 011 P	Praktikum Statistik / Practical of Statistic	1	B
19	MTR 1 012	Entrepreneurship / Entrepreneurship	2	C+
20	MTR 1 013	Agama dan Etika / Religion and Ethics	2	B+
21	MTR 1 014	Sistem Pneumatik dan Hidraulik / Pneumatic and Hydraulic System	2	A
22	MTR 1 014 P	Praktikum Sistem Pneumatik & Hidraulik / Practical Pneumatic & Hydraulic System	1	B
23	MTR 2 015	Pemrograman Komputer / Computer Programming	2	C+
24	MTR 2 015 P	Praktikum Pemrograman Komputer / Practical Computer Programming	1	B
25	MTR 2 016	Pengantar Teori Kesalahan / Introduction to Uncertainty Theory	2	C
26	MTR 2 016 P	Praktikum Pengantar Teori Kesalahan / Practical Introduction to Uncertainty Theory	1	B
27	MTR 2 017	Dasar Kalibrasi dan Standar / Basic Calibration and Standard	2	D
28	MTR 2 017 P	Praktikum Dasar Kalibrasi dan Standar / Practical Basic Calibration and Standard	1	B+
29	MTR 2 018	Sistem Pengukuran Geometri / Geometric Measurement System	2	C+
30	MTR 2 018 P	Praktikum Sistem Pengukuran Geometri / Practical Geometric Measurement System	1	B
31	MTR 2 019	Sistem Pengukuran Massa / Mass Measurement System	2	B
32	MTR 2 019 P	Praktikum Sistem Pengukuran Massa / Practical Mass Measurement System	1	B+
33	MTR 2 020	Pendidikan Pancasila dan Kewarganegaraan / Pancasila and Civic Education	3	B
34	MTR 2 021	Sistem Pengukuran Listrik / Electrical Measurement System	2	B
35	MTR 2 021 P	Praktikum Sistem Pengukuran Listrik / Practical Electrical Measurement System	1	C+
36	MTR 2 022	Sistem Instrumentasi Industri / Industrial Instrumentation System	2	B+
37	MTR 2 022 P	Praktikum Sistem Instrumentasi Industri / Practical of Industrial Instrumentation System	1	B+
38	MTR 2 023	Sistem Pengukuran Besaran Fisika / Physics Element Measurement System	2	B
39	MTR 2 023 P	Praktikum Sistem Pengukuran Besaran Fisika / Practical of Physics Element Measurement System	1	B+
40	MTR 2 024	Akuisisi Data dan Pengolahan Sinyal / Data Acquisition and Signal Processing	2	B+
41	MTR 2 025	Menggambar Instrumentasi (P&ID Diagram) / Process and Instrumentation Drawing (P&ID)	2	B+
42	MTR 2 026	Elektronika Industri / Industrial Electronics	2	C+
43	MTR 2 026 P	Praktikum Elektronika Industri / Practical Industrial Electronics	1	B+

Nama Mahasiswa / Name of Student : Hasan Gunawan Sinaga
 Nomor Induk Mahasiswa / Student ID Number : 182411007
 Program Studi / Study Program : Metrologi dan Instrumentasi / Metrology and Instrumentation

No.	Kode/ Code	Nama Mata Kuliah/ Subjects	SKS/ Credit	Nilai/ Grade
44	MTR 2 027	Metode Pengukuran / Measurement Methods	2	A
45	MTR 2 028	Etika Profesi / Professional Ethics	2	B
46	MTR 3 029	Projek Akhir 1 / Final Project 1	3	A
47	MTR 3 030	Sistem Pengukuran Besaran Minyak dan Gas / Oil and Gas Element Measurement System	2	C+
48	MTR 3 030 P	Praktikum Sistem Pengukuran Minyak & Gas / Practical of Oil and Gas Measurement	1	C
49	MTR 3 031	Antar Muka Komputer / Computer Interface	2	B
50	MTR 3 031 P	Praktikum Antar Muka Komputer / Practical of Computer Interface	1	B+
51	MTR 3 032	Komunikasi Data / Data Communication	2	B+
52	MTR 3 032 P	Praktikum Komunikasi Data / Practical of Data Communication	1	B+
53	MTR 3 033	Safety and Health / Safety and Health	2	B
54	MTR 3 034	Bahasa Inggris 1 / English 1	1	A
55	MTR 3 034 P	Praktikum Bahasa Inggris 1 / Practical English 1	1	A
56	MTR 3 035 P	Kerja Praktek Lapangan / Field Training	2	A
57	MTR 3 036 P	Projek Akhir 2 / Final Project 2	6	A
58	MTR 3 037	Bahasa Inggris 2 / English 2	1	C+
59	MTR 3 037 P	Praktikum Bahasa Inggris 2 / Practical of English 2	1	C
60	MTR 3 038	Sistem Otomasi / Automation System	2	A
61	MTR 3 038 P	Praktikum Sistem Otomasi / Practical of Automation System	1	B
62	MTR 3 039	Kapita Selekta Metrologi / Capita Selecta of Metrology	2	C
63	MTR 3 040	Pengetahuan Lingkungan / Environmental Science	2	A
64	MTR 3 041	Administrasi Kemetrolgian / Metrology Administration	2	B

Catatan : * = matakuliah transfer



23 Juli 2021

Norsahara Pasaribu, M.Sc
 196301231990032001

Nilai / Grade	Makna / Meaning	Nilai / Grade	Makna / Meaning	Nilai / Grade	Makna / Meaning
A	Sangat Baik/ Excellent	B	Baik/ Good	C	Cukup/ Average
B+	Baik/ Good	C+	Cukup/ Average	D	Kurang/ Poor