

Subject Guide – Standards and regulations for automotive engineering

Shortened Name	SRAE	Semester	2-2022
Class Time (weekly)	Mon, 9-12	Lecture hours	3h x 15w
Subject Code	090125115	Assignment and self-study	5h x 15w
ECTS credits	6	Preparation for exam	30
KMUTNB Credits	3(3-0-6)	Total working hours/semester	150

1 Revision date of this document, reasons for revision

- 22.12.2022

2 Course description

Vehicle regulations of type approval in passive safety for crashworthiness; New Car Assessment Program for Asean; Protocol evaluation based on standard and regulations; Vehicle regulations of type approval in active safety for accident prevention; Standards and regulation for vehicle components such as seat and belts.

3 Lecturer/Teaching Assistant

- Assoc. Prof. Dr. Saiprasit Koetniyom & Mr. Manus Dangchart (Research Assistant)

4 Expected learning outcomes (in accordance with the MAE program ELOs)

Definition: Course Learning Outcomes (CLOs)

CLO 1. To recognize fundamentals of vehicle type approval and component standards and regulation under vehicle collision

CLO 2 .To apply knowledge of standards and regulation for injury prevention

CLO 3. To analyse advanced research topics in the open literatures related to vehicle regulation

GELO4 - Ability to work as team member (CLO1, CLO2, CLO3)

GELO6 - Presentation skills (CLO2, CLO3)

GELO7 - Project management and team leadership skills (CLO3)

SELO3 - Knowledge of technical systems and technologies in the field (CLO1, CLO2)

SELO8 - Knowledge of applicable laws, guidelines, regulations (CLO1)

5 Assessment

Each student will be individually assessed based on the performance on coursework and paper exam, with the overall grade resulting from the shares as below:

Evaluated items	shares
Paper exam, 3 hours, on content of “ Sessions 1-4,6-7 ” of the class	35%
Paper exam, 3 hours, on content of “ Sessions 9-14 ” of the class	35%
Assignment, presentation, content of literature review and discussion	30%
Total	100%

6 Teaching materials

- Power-point presentations for lectures, handed over as reference and learning material
- E-books are provided by email before the first day of the class

7 Books and references

- 1) *Vehicle standard regulation from UNECE* <https://unece.org/>
- 2) ASEAN NCAP www.aseancap.org
- 3) Global NCAP www.globalncap.org

8 Course schedule

Week	Start of Month	Activity, Class Title	Evaluation %	Class Hours
1	01	<u>Overview of UNECE Regulation</u> - Understand concept of automotive regulation - Understand all stakeholders and topics related to vehicle regulation	6	3
2-3	01	<u>Asean NCAP protocol and assessment</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	12	6
4	01	<u>Evaluation of bus structure under regulation R66</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	6	3
5	02	<u>Group Assignment</u> - Develop implementation for testing protocols in following topics <ul style="list-style-type: none"> • Side car from motorcycle • School bus from pickup - Analyse advanced research topics in the open literatures related to vehicle regulation	-	3
6	02	<u>Evaluation of Truck cap structure under Regulation R29</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	6	3

7	02	<u>Fuel consumption and emission regulation</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions	5	3
8	02	<u>Mid-term exam (35%)</u>	-	3
9-10	03	<u>Brake testing regulation for car R13h and motorcycle R78</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	12%	6
11	03	<u>Seat regulation for passenger car</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	6%	3
12	03	<u>Seat regulation for passenger bus</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	6%	3
13	04	<u>Seat belt regulation</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	5%	3
14	04	<u>AEB from NCAP</u> - Understand testing and assessment protocol - Identify the purpose of testing conditions - Apply the knowledge for injury prevention	6%	3
15	04	<u>Assignment presentation</u> - Presentation (10%) - Literature review (10%) - Discussion (10%)	30%	3
16	04	Final Exam (35%)	-	3
Sum			100%	48

9 Details on the evaluation of Expected Learning Outcomes

		Midterm Exam	Final Exam	Assignment	Total
		35%	35%	30%	
GELO4	Ability to work as team member (CLO1, CLO2, CLO3)	5%	5%	15%	25%
GELO6	Presentation skills (CLO3)	-	-	15%	15%
GELO7	Project management and team leadership skills (CLO1, CLO2)	5%	5%	-	10%
SELO3	Knowledge of technical systems and technologies in the field (CLO1, CLO2)	15%	25%		40%
SELO8	Knowledge of applicable laws, guidelines, regulations (CLO1)	10%			10%

10 Holistic Rubrics (score marking for each question)

Score for each question	Criteria
0%	- Not answer
25%	- Only refer less than 50% of correctly related equations, theories or research materials with correct explanation.
50%	- Refer more than 50% correctly related equations, theories or research materials with sufficient explanation.
75%	- Refer more than 50% correctly related equations, theories or materials with sufficient explanation. - Convey clear sentence or structures with correctly less than 50% understanding based on references to answer the questions
100%	- Refer more than 50% correctly related equations, theories or materials with sufficient explanation. - Convey clear sentences or structures with correctly more than 50% understanding based on references to answer the question. - Show academic suggestion and discussion based on references to answer the questions

11 Analytic Rubrics (score marking for assignment)

Content	Score and criteria				
	0%	25%	50%	75%	100%
Presentation	No presentation files	- content structure of presentation - clear introduction and update situations	- content structure of presentation - clear introduction and update situations - clear relevant literature reviews - objective is introduced	- content structure of presentation - clear introduction and update situations - clear relevant literature reviews - clear gap identification of research works for objective - show methodology	- content structure of presentation - clear introduction and update situations - clear relevant literature reviews - Identify gap of research works for objective - show methodology and activity

				and activity plan	plan based on theories and literatures
Literature review	No content of research works	- present how to allocate sub-task for individual member	- present how to allocate sub-task for individual member - clear structure of categories of research works	- present how to allocate sub-task for individual member - clear structure of categories of research works - clear and correct content of each research work from literature	- present how to allocate sub-task for individual member - clear structure of categories of research works - clear and correct content of each research work from literature - identify the gap of research works from literature
Discussion	No content of discussion	- present how to allocate sub-task for individual member	- present how to allocate sub-task for individual member - present discussion of research works from literature	- present how to allocate sub-task for individual member - present discussion of research works from literature based on theories or	- present how to allocate sub-task for individual member - present discussion of research works from literature based on theories or

				other research works	other research works - Use content of discussion in own research methodology
Management of individual and team	No management of individual and team	- show pictures of team or individual meeting	- show pictures of team or individual meeting at least 2 times	- show pictures of team or individual meeting at least 2 times - show content and minutes of meeting - clear task and deadline for each member relevant to assignment	- show pictures of team or individual meeting at least 2 times - show content and minutes of meeting - clear task and deadline for each member relevant to assignment - show process of follow-up to delivery task in members and how to solve problem