



Co-funded by the  
Erasmus+ Programme  
of the European Union



# Experience in implementing DESL's lighting courses and lighting projects at HCMUT

Presenter: Truong Phuoc Hoa

Ho Chi Minh City University of Technology, VNU-HCM

Binh Duong, 24 October 2023

# Content

1. Summary of courses at HCMUT
2. Course opening and registration process
3. Course content: Lecture content, experimental content
4. Other course activities
5. Lighting project at HCMUT
6. Conclusions

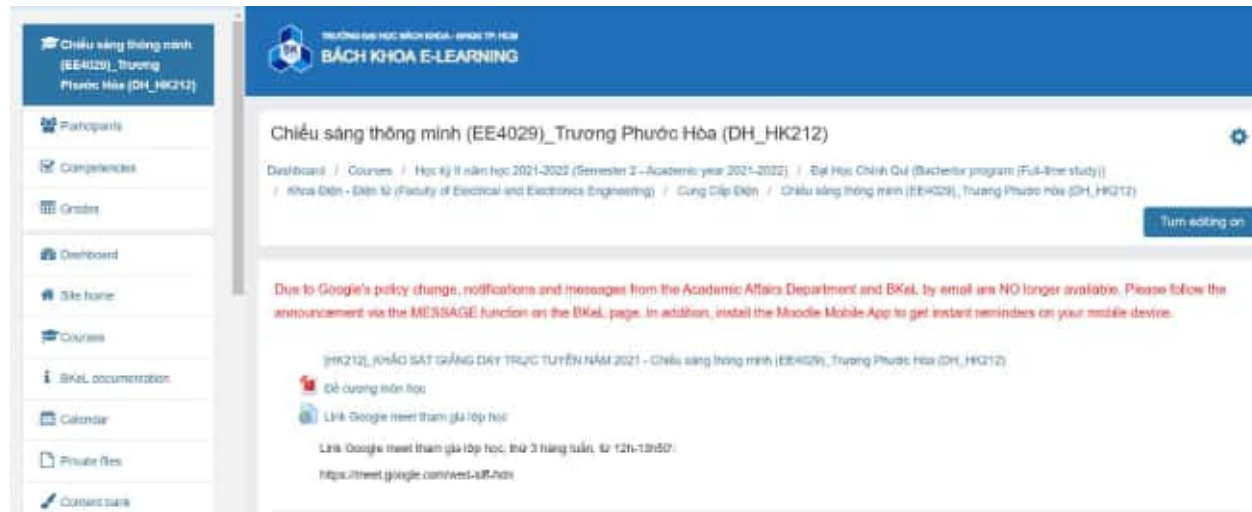
# 1. Summary of courses at HCMUT

Course	Run	# students	Evaluated?	Changes compared to previous run?
Course A (Lighting Technology)				
Course B (Light and Experience)				
Course C (Smart Lighting)				
A	1: January 2022 - June 2022	27	Yes	
A	2: September 2022 – Dec 2022	90	Yes	Improved based on feedback from first round of running, incorporation of student visit to industry
A	3: January 2023 – June 2023	39	ongoing	
B	1: August 2021 - December 2021	15	yes	
B	2: January 2023 – June 2023	19	ongoing	
C	1: January 2022 - May 2022	17	Yes	

# 1. Summary of courses at HCMUT

## Advantages:

- At HCMUT, we have a learning management system through elearning system (BKEL), so it is convenient for studying and interacting with students.
- We have two lecturers teaching theory lighting with more than 12 years of experience.



*Learning system at HCMUT*

# 1. Summary of courses at HCMUT

## Disadvantages:

- The content of lectures and experiments for the Smart Lighting course are still new, so the content and the experiments are being updated.
- According to the DESL project, the experimental time of each course is 30 hours while the experiment time in other courses at HCMUT are all 15 hours, so it also makes it difficult to build the experiments.

## Some improvements:

- Incorporation of student visit to industry.
- Invite guest lecturer from lighting company, EU University.
- Based Project Learning with participate lighting company from industry



## 2. Course opening and registration process

### **Course approval procedure**

Course's syllabus and content will be approved by:

- Head of Department,
- Dean of faculty and
- Faculty Scientific Council

-> Therefore, it is quite easy to ask for a course code at HCMUT



# 3. Course content/ Lecture content

## Advantages:

The lecture content based on the modules provided by the EU partner, so it is very convenient

We also inherit from the courses of Lighting Technology (from 1998):  
Quiz bank, exercises





# 3. Course content/ Experimental content

## Equipment at HCMUT

- CCD Spectroradiometer Integrating Sphere
- Experiment kit for Home Smart Lighting
- Experiment kit for Office Smart Lighting
- CRI Illuminance Meter
- Luminance meter





# 3. Course content/ Experimental content

## Experimental content at HCMUT

1. Determination of characteristic dependence of discharge lamps
2. Experiment on building optical distribution of luminaires
3. Experiment to measure the illuminance distribution of a room in the presence and absence of natural light
4. Experiment to measure the characteristics of lamps by integral sphere
5. Experiment with intelligent lighting control of lamps in the room with the lighting system of MPE, Philips Dynalite control
6. More experiments are under construction

## 4. Other course activities

We invite lighting companies to present updated topics to students. Invited Signify to do Webinars for students:



*Lighting in agriculture and arts*



*Smart lighting for offices and street lights*

# 4. Other course activities

For students to visit and experience at Signify's VLAC center in Ho Chi Minh City and in Dien Quang, MPE so that students can have practical experience and modern measuring equipment

Students can learn some course online:

- <https://www.signify.com/global/lighting-academy>



**VLAC**

Những giải pháp chiếu sáng thông minh sẽ được trải nghiệm tại VLAC:

- 01 Philips Hue**  
Đảm định
- 02 Luminous Carpets**  
Khám phá thảm có hiệu ứng chiếu sáng
- 03 Luminous Textile**  
Tổ chức các buổi tương tác các chương trình chiếu sáng trên khung vải
- 04 Chiếu sáng thông minh chuyên dụng**
  - Interact Hospitality - Lĩnh vực khách sạn
  - Interact City - Thành phố thông minh
  - Interact Industry - Lĩnh vực công nghiệp
  - Interact Sport - Lĩnh vực thể thao
  - Interact Landmark - Màn trình diễn ánh sáng sống động
  - Interact Office: Tổ ưu hóa không gian làm việc, nâng cao năng suất nhân viên



# 4. Other course activities

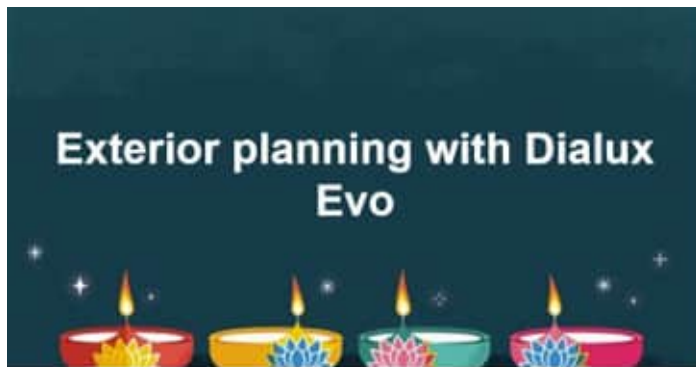
- Sponsor for the lighting laboratory from MPE
- HCMUT sign MOUs with Signify, Dien Quang, MPE...





# 4. Other course activities

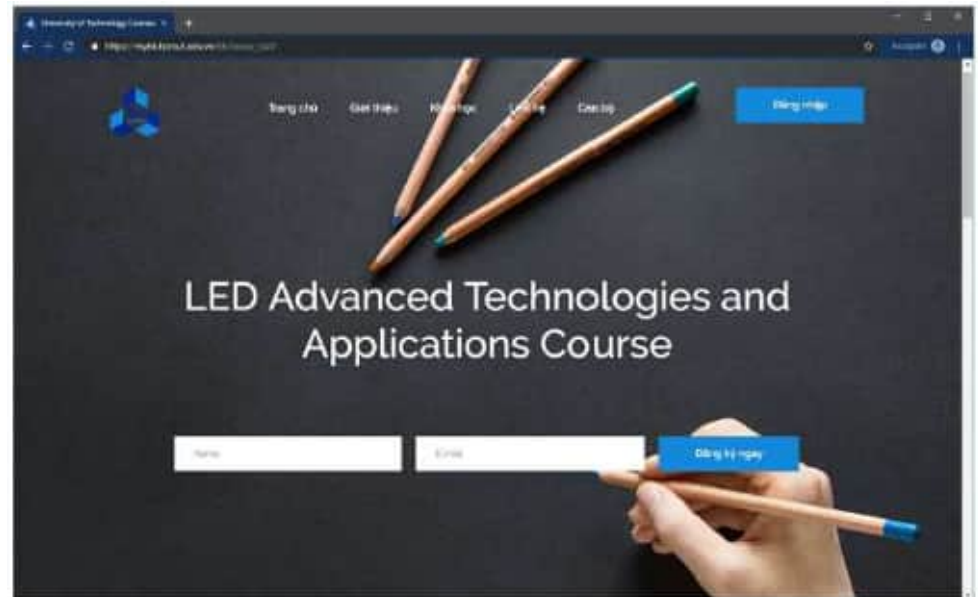
Training and certification for MPE



Ho Chi Minh City, February 2018



Developing an online training course for LED (UNDP project)



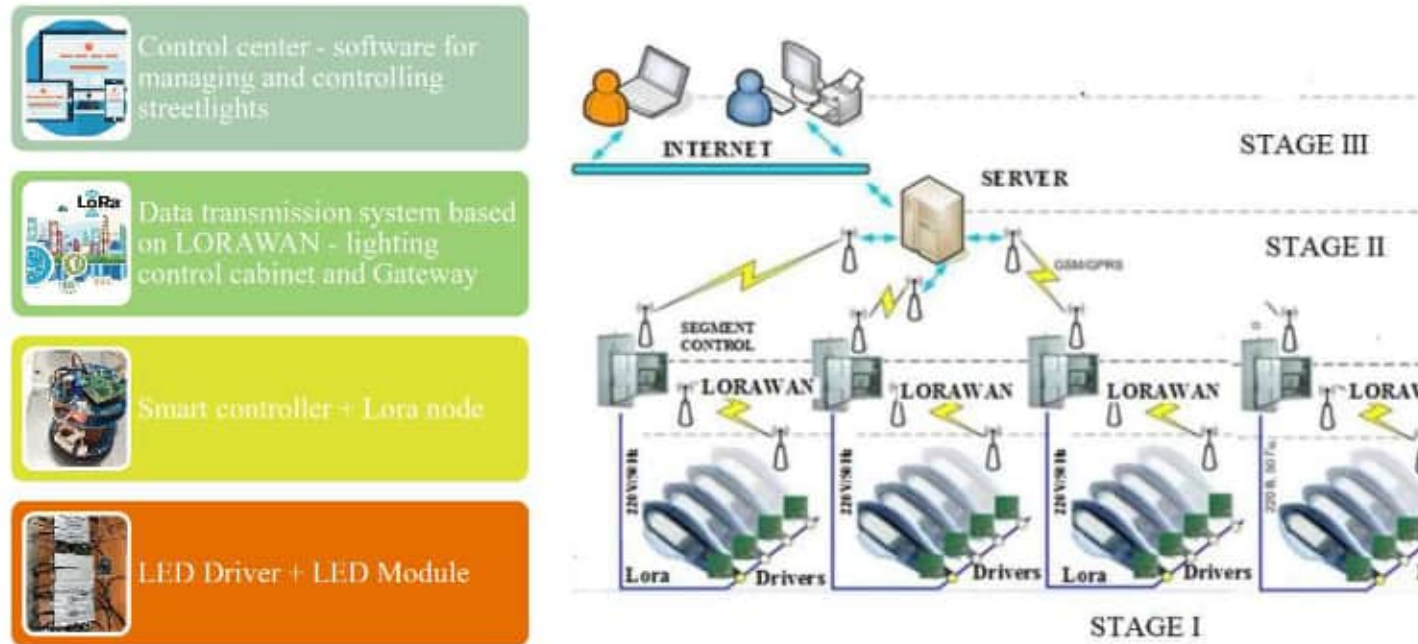
Co-funded by the Erasmus+ Programme of the European Union



# 5. Lighting project at HCMUT

1. **Smart Lighting:** the pilot project with a total cost about 1 million USD on building a smart street lighting system using LED in Vietnam

## STRUCTURE OF SMART LIGHTING SYSTEM



# 5. Lighting project at HCMUT

## 1. Smart street lighting system using LED.

### TESTING - OPTIMIZE DESIGN





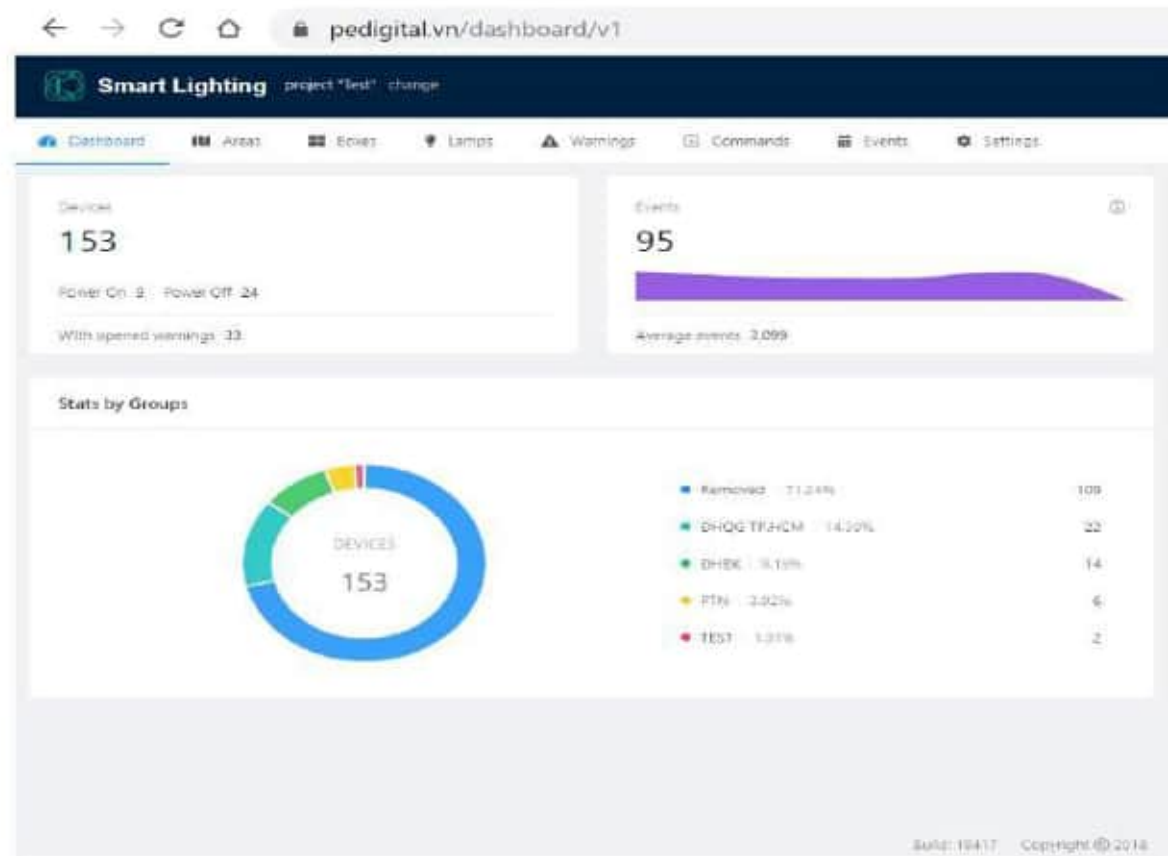
# 5. Lighting project at HCMUT

## 1. Smart street lighting system using LED.

### CENTRAL CONTROL AND DATA MANAGEMENT

#### FUNCTIONS

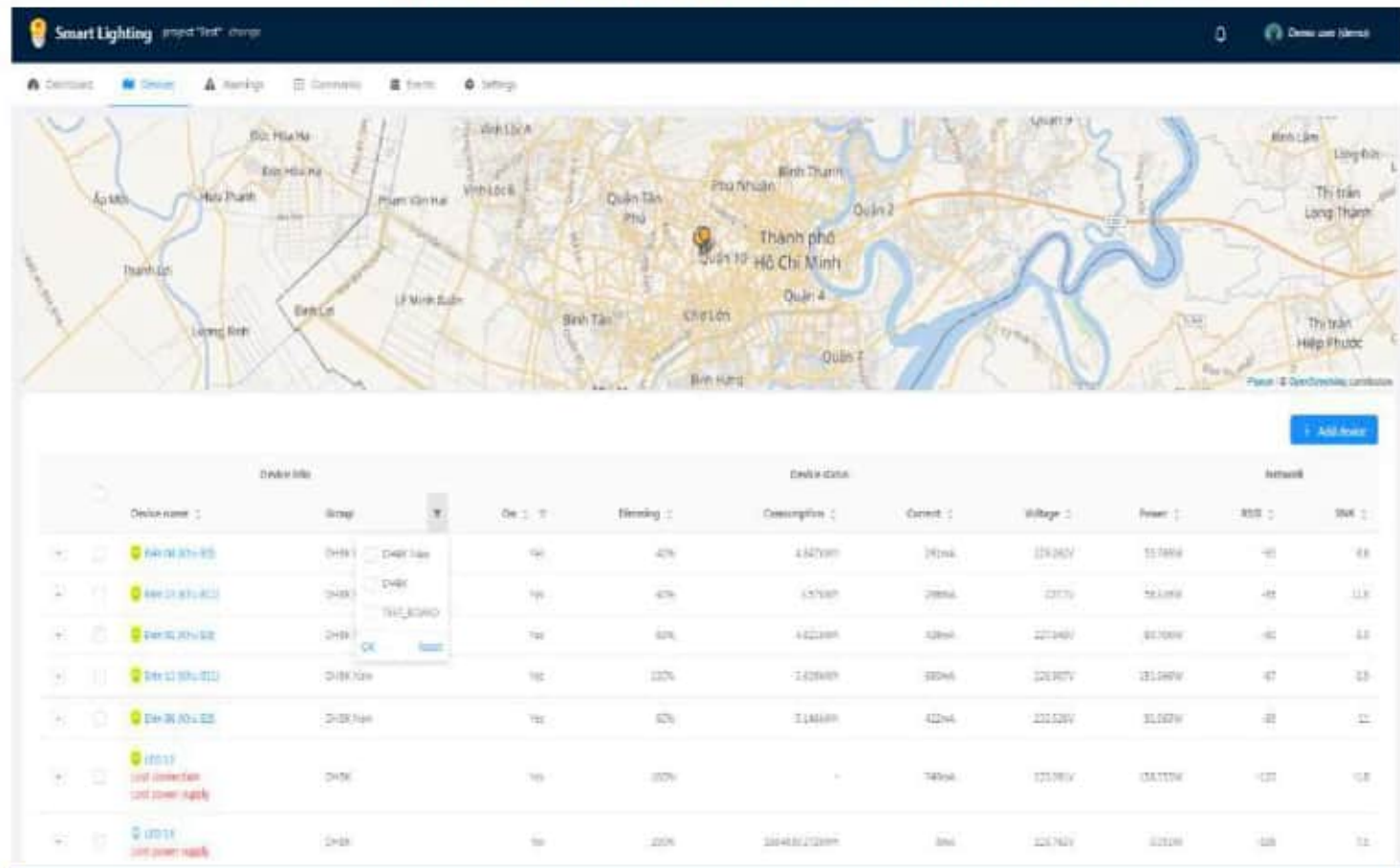
- Manage many streetlight projects
- User access control to manage street lights at District / Ward level.
- Group control (control cabinet) and individually controlled lamp
- Directly monitor faults for each lamp / cabinet in each area
- Create groups and projects.
- Parameter storage and data provisioning
- State control and lighting control system
- Scheduling dimming control from software
- Maintenance and alarm system status



# 5. Lighting project at HCMUT

## 1. Smart street lighting system using LED.

### DEVICE MANAGEMENT & NODE STATUS



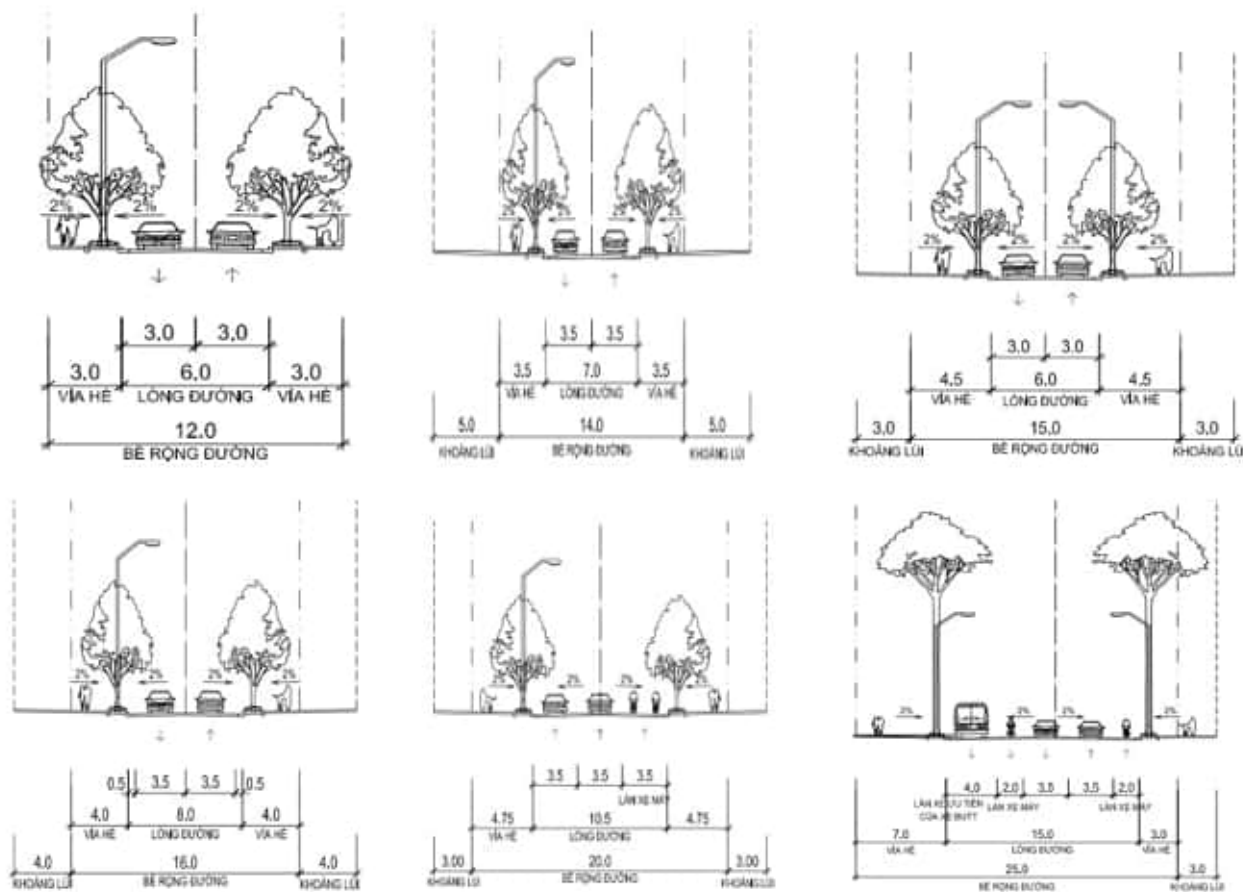
# 5. Lighting project at HCMUT

## 1. Smart street lighting system using LED.



# 5. Lighting project at HCMUT

## 2. Developing the methodology for a smart lighting system in Ho Chi Minh City using LED: (80,000 USD)



# 5. Lighting project at HCMUT

## 2. Developing the methodology for a smart lighting system in Ho Chi Minh City using LED:

- Arrange lamps in 3 different ways: one side, staggered two sides, symmetrical two sides, middle of the road.
- Change the height of lamp posts, change the distance of lamp posts, change different road surfaces

### The results to compare are:

- Build a relationship between average luminance according to pillar height, pillar distance and compare with lighting standards.
- Build a relationship between average illuminance according to pillar height, pillar distance and compare with lighting standards.
- Find the optimal design value when using LED lamps

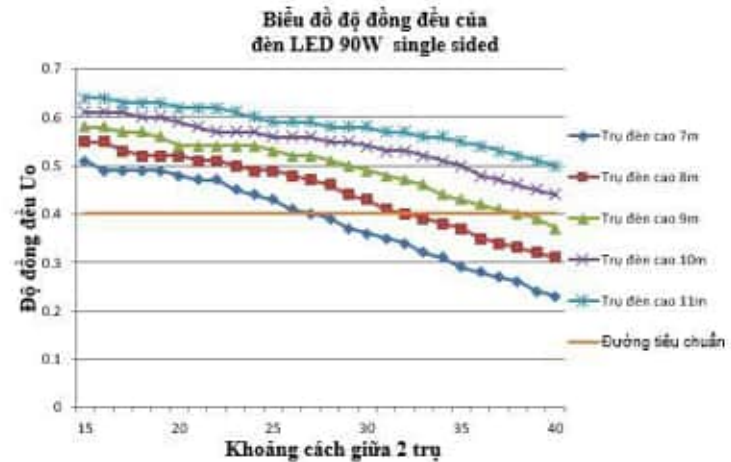
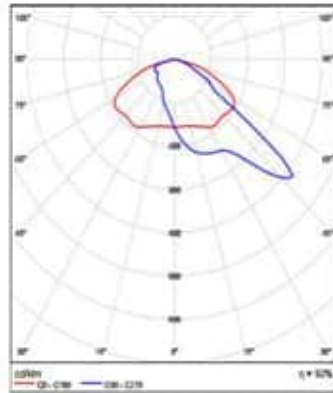


# 5. Lighting project at HCMUT

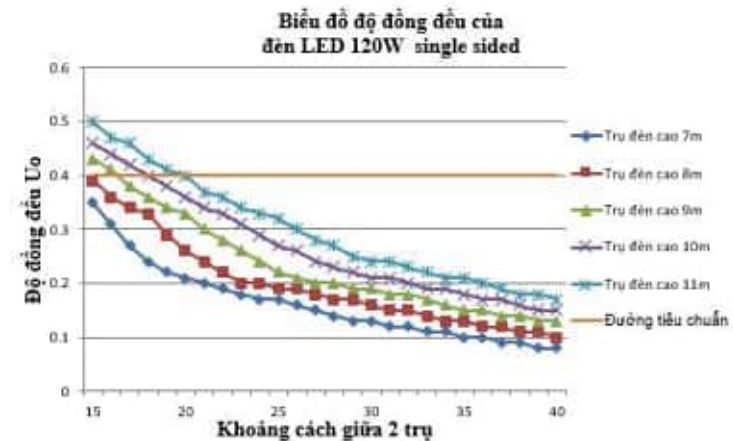
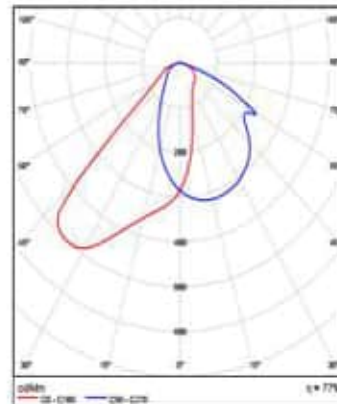
## 2. Developing the methodology for a smart lighting system in Ho Chi Minh City using LED:



Light output ratio: 91.67%  
 Lamp luminous flux: 8900 lm  
 Luminaire luminous flux: 8159 lm  
 Power: 91.0 W  
 Luminous efficacy: 89.7 lm/W

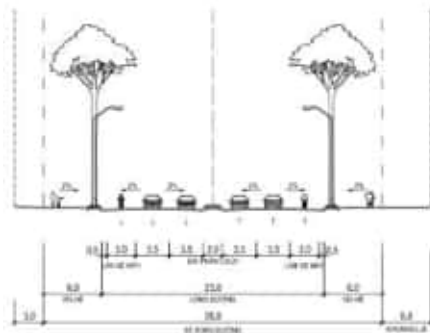


Light output ratio: 77.31%  
 Lamp luminous flux: 14900 lm  
 Luminaire luminous flux: 11504 lm  
 Power: 119.0 W  
 Luminous efficacy: 96.7 lm/W

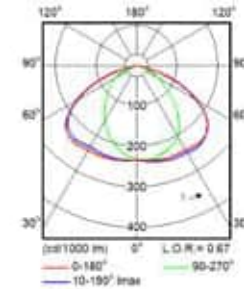


# 5. Lighting project at HCMUT

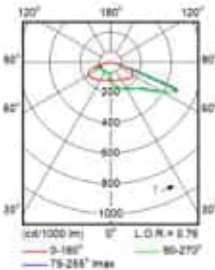
## 2. Developing the methodology for a smart lighting system in Ho Chi Minh City using LED:



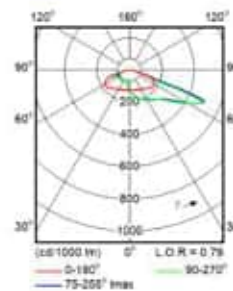
HPS 250W



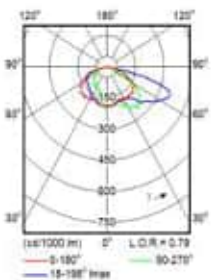
LED 119W  
(ECO142)



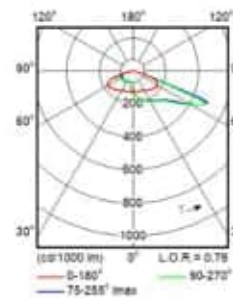
LED 72W  
(ECO85)



LED 164W  
(ECO150)



LED 93W  
(ECO93)





## 6. Conclusions

- We design the lecturer based on the modules provided by the EU partner, so it is very convenient
- We were supported by EU universities in teacher training, lighting design, experiments from EU universitie that is the good foundation for building the courses at HCMUT.
- However, there is still a lack of exercises and experiments (under construction)
- Several improvements were made based on student feedback





Co-funded by the  
Erasmus+ Programme  
of the European Union



# Thanks for your attention !

Truong Phuoc Hoa  
Email: [tphoa@hcmut.edu.vn](mailto:tphoa@hcmut.edu.vn)  
Tel: (+84)919004974