

Oksana Bilinska

**DEPARTMENT OF DESIGN AND ARCHITECTURE BASICS:
INTERIORS' DRAWING**

*Lviv Polytechnic National University,
12, S. Bandera Str., 79013, Lviv, Ukraine
oksanabilinska@gmail.com*

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Abstract. The theme of this article is teaching architectural drawing skills. The sequence and stages of public buildings interior drawing are described here. The steps of interiors perspective construction are described taking Lviv Polytechnic National University interiors as an example. Common student's difficulties and mistakes are analyzed since architectural life drawing of the historical buildings' interiors on the spot is useful for obtaining knowledge and skills in professional education of architecture students.

Key words: architectural drawing, interior, perspective, Lviv Polytechnic.

1. Introduction

The Department of Design and Fundamentals of Architecture of Lviv Polytechnic National University plays an important role in the initial stage of the process of preparing future architects. Here, our students carry out multistep tasks in fine arts disciplines, including "Drawing, painting, sculpture". All students draw on the spot interior spaces of the Lviv Polytechnic National University. This helps students improve their understanding and skills of perspective construction of space in modern architectural education. Another way to improve students' skills is practicing academic drawing. It reveals the principles of constructing a realistic image on the plane and provides an opportunity to deepen students' knowledge and improve their skills, which are necessary for an independent creative work of an architect. Students develop the ability to analyze, compare, generalize the depicted objects and the space while drawing on the spot. Students can easily recall objects that they've already drawn on the spot and then they recreate the object on the paper. In order to construct a perspective of an interior, a student-architect must understand the basics of composition and the basics of the perspective studied during the execution of previous tasks with the construction of geometric bodies, still life, architectural details. Sources [1–5] reveal a number of issues related to the use of the figure as a way of expression in architectural creativity. The main focus is set on the study of concepts, techniques and directions of the drawing for the preparation of architects. This research focuses on the problems and mistakes in building perspective for interiors.

2. Basic theoretical section

The drawing is the beginning of any special artistic discipline: painting, composition, designing. Drawing in the work of architects is the main way of expressing architectural design. Different techniques (pencil, ink, charcoal) of drawing or sketch (Fig. 1) can give an architect an idea of the final result of his architectural image. Drawing develops figurative, associative and abstract thinking, and forms the aesthetic outlook of a future architect.

Drawing is also a great way to study architecture. The mastery of educational skills in drawing contributes to the study of the richness of the architecture of historical epochs, which left remarkable examples of virtuoso skill. So, in Lviv Polytechnic, the training of architects for academic drawing takes place in the main building of the university. Students study architectural orders, details, forms, polychrome and history of the construction of the main building of the Polytechnic at the same time.

Students perform the “Drawing of the Interior of the (Public) Building” task in the 2nd semester of the 1st year of studying (A2 format, pencil, coal, sanguine). Instruments are linear, tonal. Lighting is natural lateral, upper. As objects for the classroom drawing of fragments of public interior, it is possible to offer the premises of an educational institution, various spaces of the main building of the Lviv Polytechnic National University (lobby of the main building, corridors of the II-III floors of the educational building, hall halls, volumes of stairs, arcade – atrium II floor, assembly hall, etc.) (Fig. 1–7).

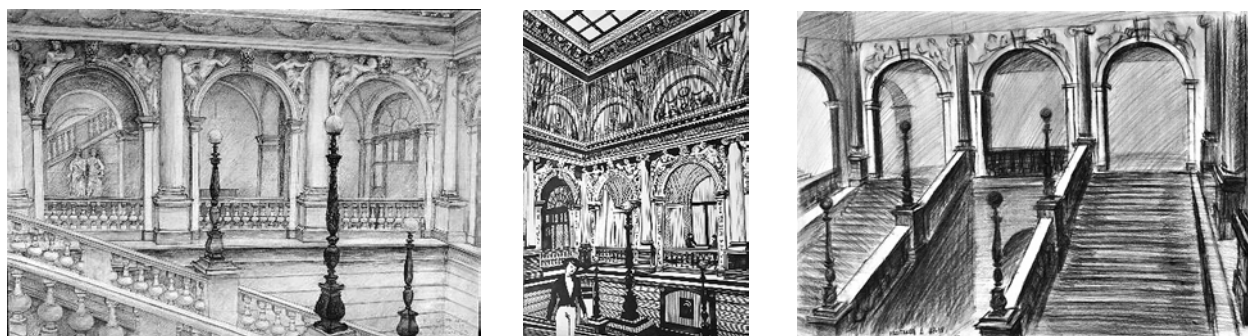


Fig. 1. Interior of the 2nd floor of the Lviv Polytechnic National University
(student works by: Rudetska S., Yuskovets M., Mashtakov D., headed by O. Bilinska, 2014, 2015).
Technique: A2 paper size, pencil, ink, charcoal



Fig. 2. Interior of the lobby of the Lviv Polytechnic National University
(student works by: Naumchuk O., Tkachuk G., headed by O. Bilinska, 2014, 2015).
Technique: A2 paper size, pencil

The purpose of the drawing by students-architects is to master the fundamentals of the graphic language of academic drawing and compositions; study of methods of quick drawing, sketching; development of technology of linear, tonal drawing. The specific goal of the task is to study the perspective and constructive creation of a fragment of the interior of a public building, assimilate the ways of transferring the depth of space, linear scale, revealing the proportional features of perspective contractions of architectural elements in the interior (ordering: pilasters, columns) and distances between them, displaying air perspective by detecting light, shadow, contrast, environmental impact via active lines and local tones. In an academic approach, it is important to perform classical productions for the process of architectural drawing. The creative process of the architectural design of the interior is based on successive stages.



Fig. 3. Interior of the lobby of the Lviv Polytechnic National University (student work by Rakochny S., headed by O. Bilinska, 2014). Technique: A2 paper size, pencil



Fig. 4. Interiors of the lobby and stairs of the 2nd floor of the Lviv Polytechnic National University (student works by: Rakochny Ya., Dushenchuk T., headed by O. Bilinska, 2014, 2015). Technique: A2 paper size, pencil

The first stage is the formation of a problem. Study of the content of form and space: an understanding the structure of the interior in terms of space organization, geometric design (framework, connecting each other in the space of individual elements, parts in a single image) and plastic structure. This is an imaginary layout of a graphic image of an interior fragment: the partitioning of interior planes by columns or pilasters, ending with

cross vaults or mirroring ceilings. Determining the interior style of the building, by means of which the compositional expressiveness of the interior space of the architectural object is encoded, is an artistic material in which aesthetic information, a specific image form is created. Therefore, in the initial stage of the drawing, it is important to find an expressive point of view, to select the composition of the interior fragment, to determine the horizon line and the points of coincidence (in complex multi-level fragments of interiors containing stair marches, the number of conversion points increases).

The second stage is the variability of creative research. Creating sketches of compositional solutions of the perspective of the interior from different positions when choosing a point of view – is a feature of visualizing creative composite solutions, the ideological content of the depicted objects. To create thumbnails use the traditional frameworks, and nowadays students are using images from mobile phone screens more and more. Sketches of an interior design can often be conditional, linear, concise, modest in choice of graphic instruments. In the drawing of the interior students often have difficulty with the layout, the choice of orientation of the perspective of the interior (horizontal or vertical composition). Often, students begin to depict fragments of the interior, and the overall composition turns out to be too full or too sparsely furnished.

The third stage – selecting only one sketch and the optimal angle. You can tone different sketches to find one you're satisfied with. You can use tone on small sketches, setting the tonal difference between the perpendicular planes of the interior. Next, the potential of future graphic work is compared, and the idea of how best to portray a solution is formed.



Fig. 5. Interiors of the 2nd floor of the Lviv Polytechnic National University (student work by Pivtorak Yu., headed by O. Bilinska, 2015). Technique: A2 paper size, pencil

The fourth stage – the layout of the selected sketch on a large scale, awareness and development of an optimal solution, and implementation using various drawing tools.

After determining the structure of the division of the planes of the interior (for example, ordering elements – pilasters), it is important to further perform a linear constructive perspective construction qualitatively and find out the large-scale coordination of small architectural elements and decor with the main dimensions of the interior.

The fifth stage – the definition of proportions and magnitude. Proportions, magnitude - it is worthwhile to give a special role in the construction of the interior. Proportion means size ratio, the ratio of height to width, one part of the structure to another, a certain ratio of individual parts of the interior. Proportion – one of the

main instruments used in architecture and architectural design. In the drawing, students use knowledge on the study of classical forms, the construction of architectural orders, studied established laws, tested canons, confirmed by nature observations and instructions of great masters. Correct setting of proportions in the interior image contributes to the unity and harmony of academic drawing. Violation of proportions reduces artistic expressiveness of architecture. In the perspective construction, it is important to determine the proportional contractions of the dimensions of the architectural elements and the space between them. The magnitude – the proportionality of the interior of the architectural building with its main “module” – a man. The magnitude (the height of the interior) is measured not in meters, but in the proportional relation to the height of the person. To reveal the magnitude of the image of the human figure and proportional elements and details of the interior.

The sixth stage. Perspective – the spatial construction. The foundations of the drawing are closely related to the descriptive geometry and perspective. The ability to draw geometric shapes in the future greatly facilitates the interior design of buildings. When students build a linear perspective of the interior, using the perspective grid of L.-B. Albery, they must constantly think, compare, develop accurate eye, reject the methods of drawing and copying. Artists use laws of perspective to change the size and the appearance of the interior of the buildings. Before drawing on the spot, it is necessary to determine the position of the depicted space in relation to the line of the horizon: at a level above or below the horizon. The position of the line of the horizon changes with the position of the student. The basic rules of perspective image of an object are known, which allow to construct a volumetric form with an any aspect and narrowing: the farther the subject is from us the smaller it seems; parallel lines converge at one point on the line of the horizon; For the artist the horizon line is placed at the level of their eyes (depending on the position from which the immobile object is shown (standing or sitting), the horizon line rises (high horizon) or decreases (low horizon)); horizontal lines (planes) that are below the horizon line, when departed into depth, rise to the horizon line; lines (planes) that are above the horizon line, down to the points of ascension on the horizon; The lines (planes) located at the horizon level are depicted by a horizontal line. Vertical lines and lines (planes) parallel to the picture plane (corresponding to the vertical and horizontal edges of the sheet – the frontal position), do not change the direction of the image. Intersection points on the horizon line are usually outside the sheet and are not displayed, but only appear during the drawing. However, mistakes are often encountered when constructing perspective. Students do not always build horizon line on the level of the eye, but mostly above. They neglect the specific rules of constructing a public interior, when the height of the lobbies, corridors and premises itself significantly exceeds the accepted height of other premises. Often, parallel lines do not reach the convergence point, even in simple one-point perspectives.



Fig. 6. Interiors of the 2nd floor of the Lviv Polytechnic National University (student works by: Petryshyn A., Popadyuk O., headed by O.Bilinska, 2014, 2015). Technique: A2 paper size, pencil

So, in constructing the perspective of the corridor, one should not forget about the placement of the top of the pilasters, columns and the bottom of their bases (even left and right) on one horizontal line. The linear perspective problem increases with two points of convergence on the side where the convergence point is far and the lines are still drawn as horizontal. Even getting acquainted with the theoretical aspects of the perspective does not help when the perspective climb points are placed too close to each other, the image of perspective is deformed. It is also important that the interior design of the foreground depicts a part of the floor; otherwise, it would seem that these wall surfaces, pilasters capitals were “suspended” in the air.

Due to the lack of spatial imagination it is difficult for some students to build unfolded forms (cornice of pilaster capitals, jumpers, window sills, profiled parapets of balustrades): a large number of perpendicular planes placed horizontally creates problems in constructing a linear perspective. Also, while depicting the interior from the screens of smartphones, vertical elements of the order column and pilasters begin to look like they're leaning and falling. Preliminary study of elements of the order of capitals, bases, provided by the curriculum, facilitates the problem of perspective construction.

The seventh stage is a linear perspective with precise linear construction of the interior and details. The line may be displayed 3D: to be thick, thin, to intensify, to deintensify, to disappear. Contrast of thin and thick lines creates the impression of distance and perspective. Application of different lines gives the architect the opportunity to solve perspective and spatial problems. The linear perspective is the main expressive instrument for building an interior perspective. In addition to the linear perspective, at the final stage of the drawing, it is necessary to convey the air perspective, that is, the illusion of depth of the space by the thickness, saturation of the line, to detect a change in the tonal relation associated with the spatial location and the distance of elements from the light source.

Eighth stage – tonal analysis. This is a depiction of different surfaces of the interior (walls, vaults, floors) using the tone; characteristic features of tone are black, gray, white spots with an established silhouette; the ratio of light-dark, contrast and nuance.

In the tonal drawing, it is necessary to constantly compare images with original, showing errors, inaccuracies and correcting them not only with the help of a line, but also a silhouette of the form. A characteristic feature of a tonal pattern is a silhouette - a plane with defined shape, for example, a wall plane. The concept of the tone is used as a definition of the light or shadow on an object, which is expressed in black to white ratio. Thus, the objects that are neutrally colored (achromatic) – white, gray, black – are defining the tone. Thus, the tone is the property of achromatic colors, that does not depend on the illumination conditions and the air environment, the tone transmits the degree of lightness of this object.

The ninth stage is a light-shade-shadow solution. The concept of the tone is related to the illumination, because the degree of light is displayed only with the tonality of the degrees of lightness (from the maximum of the light, to the maximum of the shadow) and illumination. If the interior perspective is built correctly, then the drawing already creates an impression of depth of space. This impression is intensified when working out the illumination of perpendicular planes in space: walls, floors and ceilings. Also the difference is significant in tone between distant and close areas of the walls and floor planes. Tonal difference created by different force of stroke also increases the impression of depth of space and makes the drawing realistic. The first long interior drawing is better to do in the frontal position. Contrast tone increases frontal depth. The tone is explained as the degree of illumination of each part of the surface of the form, as its light and shade. The light emitter depends on the illumination, with artificial light the light emitters are clearer, more contrasting, in daylight in diffused light they are vague. The lighted window may be the lightest spot in the picture. Initially, the main relations between light and shadow are outlined without detail. Based on the tonal relation from the dark object to the lightest, observing the difference of objects by tone, it is necessary to compare shadows, revealing the difference in tone. It is needed to determine the direction of the shadows from the light source, determine the areas of own and falling shadows. After expressing lighting in general, we must proceed to the halftones, and pay attention to expression of the basic form and depth of space.



Fig. 7. Interior of the second floor corridor and staircase of the Lviv Polytechnic National University (student works by: Dmitryv K., Lyzanets' I., Voznyak V., headed by O. Bilinska, 2014, 2015).
Technique: A2 paper size, pencil

In the final stage, a clear interpretation of plans and generalization of the fragment of the interior of the public building, are common. Errors with inappropriate tinting of the interior perspective are relatively insignificant with regard to the wrong linear perspective, and they can be fixed (obscured, highlighted fragments) in the process of completing the interior drawing.

Conclusions

Academic drawing is one of the most important professional areas of teaching arts disciplines at the Department of Design and Architecture Basics. Therefore, I reviewed one of these mandatory drawing tasks that the students of our department perform. I described the methodology of drawing architectural interiors. I chose the excellent Neo-Renaissance interiors of the Lviv Polytechnic's premises as the objects for performing this task. I have highlighted step-by-step stages of interior perspective drawing. These steps are: analysis of the interior structure and space, sketches creation, one sketch selection, and its layout on a large sheet, proportions and magnitude definition, perspective-spatial construction implementation, linear perspective creation, tonal resolution, light-shadow construction, and air perspective creation. For each of these stages of the interior drawing, I have shown some common difficulties and mistakes that students are most likely to encounter. The article is illustrated with students' drawings of interiors of the Lviv Polytechnic National University main building.

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КАФЕДРА ДИЗАЙНУ ТА ОСНОВ АРХІТЕКТУРИ: РИСУНОК ІНТЕР'ЄРІВ

***Анотація.** Кафедра дизайну та основ архітектури Нац. ун-ту “Львівської політехніки” відіграє важливу роль у початковому етапі процесу підготовки майбутніх архітекторів. Тут майже 145 років від дати заснування кафедри студенти виконують етапні завдання з циклу образотворчих дисциплін, а саме з дисципліни “Рисунок, живопис, скульптура”. Академічний рисунок допомагає отримати розуміння та навички перспективної побудови простору, вміння аналізувати, порівнювати, узагальнювати зображуваний простір інтер'єрів, ордерні аркади, архітектурні ордери, декор. Для побудови перспективи інтер'єру студент-архітектор використовує знання з основ композиції та основ перспективи. Враховуючи нагальну потребу у визнанні важливості викладання академічного рисунок для освіти архітекторів та у зв'язку з планомірним скороченням годин на цю дисципліну, виникла необхідність у детальнішому аналізованні методики виконання та типових помилок одного з обов'язкових академічних завдань з рисунок для виконання студентами-архітекторами.*

Подано та узагальнено методик виконання архітектурного рисунок інтер'єру. Натурою для виконання завдання слугують неоренесансні інтер'єри Львівської політехніки. Виділено покрокові етапи виконання побудови перспективи інтер'єру. А саме: аналіз структури і простору інтер'єру, створення ескізів, відбір одного ескізу, компоновання його на великому аркуші, визначення пропорцій, масштабності, виконання перспективно-просторової побудови, лінійної перспективи, тональний розбір, світло-тіньова побудова і повітряна перспектива. До кожного етапу виконання рисунок інтер'єру наведено найрозповсюдженіші типові труднощі та помилки, які найчастіше допускають студенти. Статтю проілюстровано студентськими роботами рисунок інтер'єрів головного корпусу Нац. ун-ту “Львівська політехніка”. Акцентовано важливість архітектурного рисунок для вивчення особливостей архітектурних стилів інтер'єрів у контексті вивчення історії архітектури. Перспективою подальшого висвітлення може бути методика та особливості виконання архітектурного рисунок інтер'єру сакральних будівель.

***Ключові слова:** архітектурний рисунок, інтер'єр, перспектива, Львівська політехніка.*