```
import numpy as np
import pandas as pd
from sklearn.preprocessing import StandardScaler
import matplotlib.pyplot as plt
```

```
data = pd.read_csv('p_iris.csv')
```

```
# Assuming the last column is the target label and the rest are features
X = data.iloc[:, :-1].values # Features (all rows, all columns except the last)
y = data.iloc[:, -1].values # Target (all rows, last column)
```

```
# Step 2: Standardize the data
scaler = StandardScaler()
X_std = scaler.fit_transform(X)
```

```
# Step 3: Calculate the covariance matrix
cov_matrix = np.cov(X_std.T)
```

```
eigen_values , eigen_vectors = np.linalg.eig(cov_matrix)
```

```
sorted_indices = np.argsort(eigen_values)[::-1]
eigenvalues_sorted = eigen_values[sorted_indices]
eigenvectors_sorted = eigen_vectors[:, sorted_indices]
```

```
n_components = 2
eigenvectors_subset = eigenvectors_sorted[:, :n_components]
```

```
X_pca = X_std.dot(eigenvectors_subset)
```

```
plt.figure(figsize=(8, 6))
plt.scatter(X_pca[:, 0], X_pca[:, 1], c=y, edgecolor='k', s=100)
plt.xlabel('Principal Component 1')
plt.ylabel('Principal Component 2')
plt.title('PCA of Iris Dataset')
plt.grid()
plt.show()
```